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2017 Embedded Markets Study

Integrating IoT and Advanced Technology Designs, Application Development & Processing Environments

April 2017

Presented By: EETimes embedded

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The Power of AspenCore

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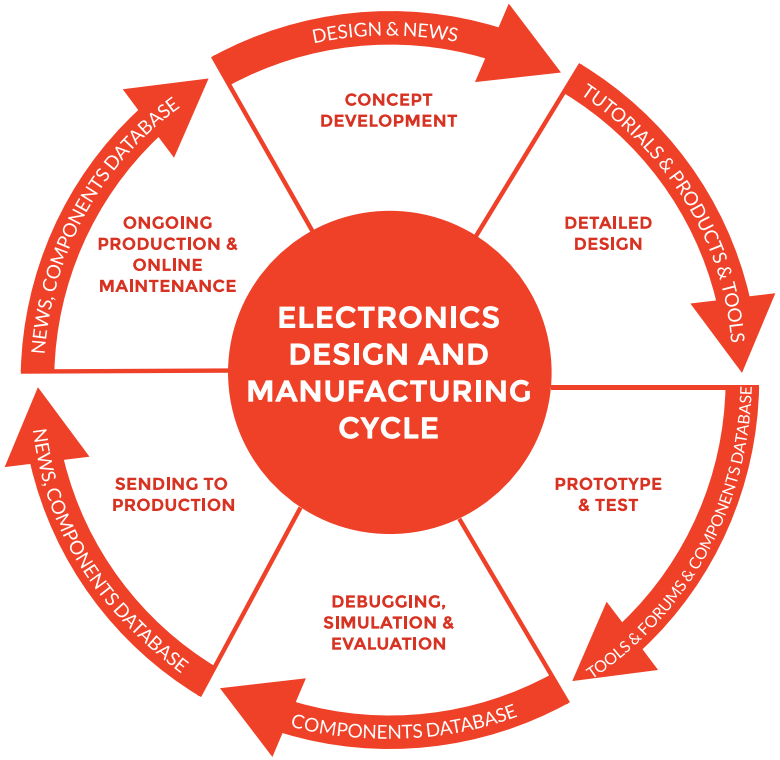

We touch electronics professionals at every point in the design and manufacturing cycle.

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The Key is the Journey

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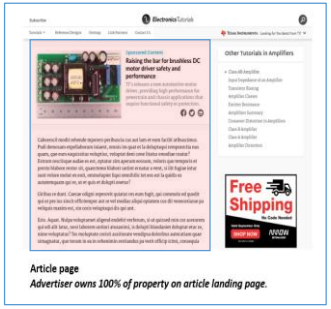
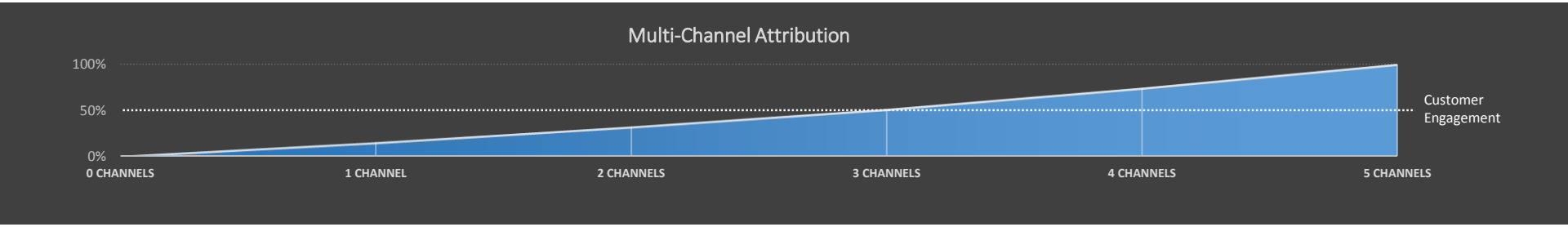
		 Article page *Advertiser owns 100% of property on article landing page.*	 Article page *Advertiser owns 100% of property on article landing page.*	



Profile for Max The Magnificent

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- Clive "Max" Maxfield is the Editor in Chief at Embedded.com. and EEWeb.com.
- Max received his BSc in Control Engineering in 1980 from Sheffield Hallam University, Sheffield, UK. He began his career as a designer of central processing units (CPUs) for mainframe computers. Over the years, Max has designed everything from silicon chips to circuit boards, and from brainwave amplifiers to steampunk "Display-O-Meters." He has also been at the forefront of Electronic Design Automation (EDA) for more than 30 years.
- Well-known throughout the embedded, electronics, semiconductor, and EDA industries, Max has presented papers at numerous technical conferences around the world, including North and South America, Europe, India, China, Korea, and Taiwan.
- Max has given keynote presentations at the PCB West conference in the USA, the FPGA Forum in Norway, and the Embedded Everywhere conference in Denmark. He's also been invited to give guest lectures at several universities in the USA, Oslo University in Norway, and Sheffield Hallam University in the UK.
- In 2001, Max "shared the stage" at a conference in Hawaii with former Speaker of the House, "Newt" Gingrich. Max is the author and/or co-author of a number of books, including Designus Maximus Unleashed (banned in Alabama), Bebop to the Boolean Boogie (An Unconventional Guide to Electronics), EDA: Where Electronics Begins, FPGAs: Instant Access, and How Computers Do Math.

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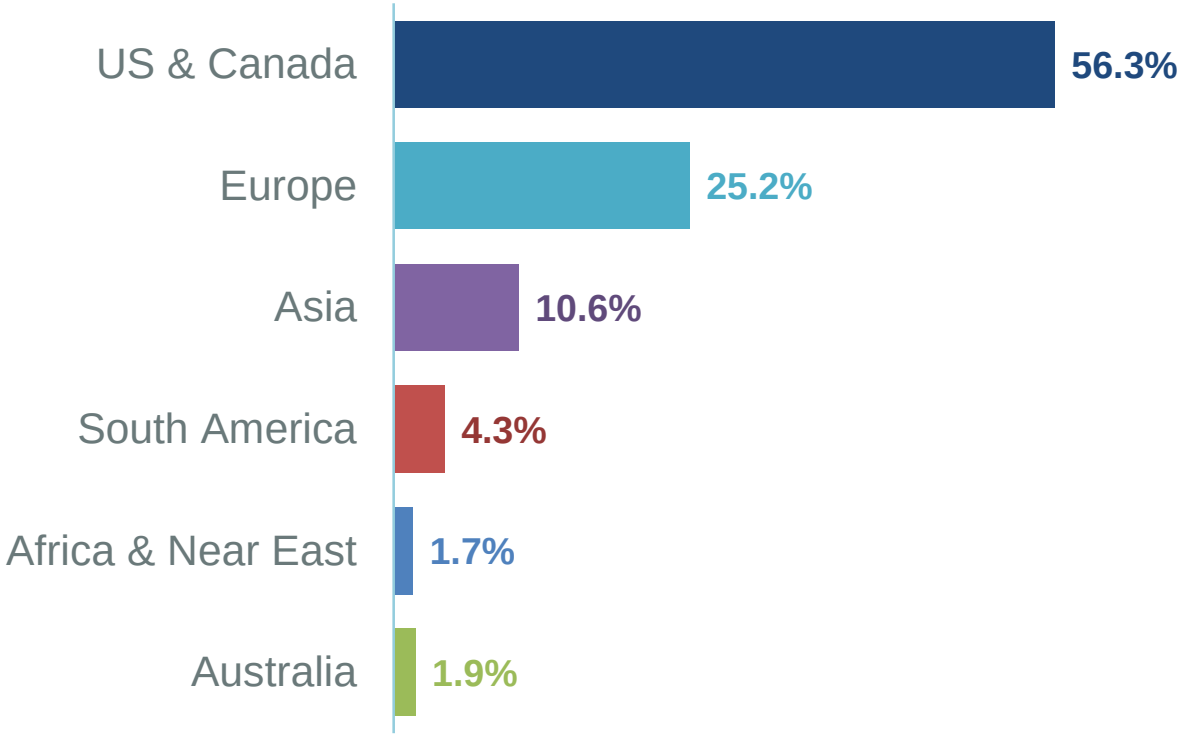
Preliminary Comments

- The venerable EETimes/Embedded.com Embedded Markets Study has been conducted annually for over 20 years, with the sole exception of 2016, when organizational transitions and other events prevented the study from being fielded. Trending the data in this study bridges back to 2015 and the previous three to five years where relevant.
- Remarkable consistency over the years has monitored both fast and slow moving market changes. A few surprises are shown this year as well, but overall trends are largely confirmed.
- Emerging markets and technologies are also tracked in this study. New data regarding IoT and advanced technologies are included.
- The data set this year is smaller than in previous years, but still exceeds a very high standard of confidence (see next slide). Data over 1100 respondents is considered the high end of market research projectability. Data as low as 200 respondents is still quite reliable and useful for marketing projections.

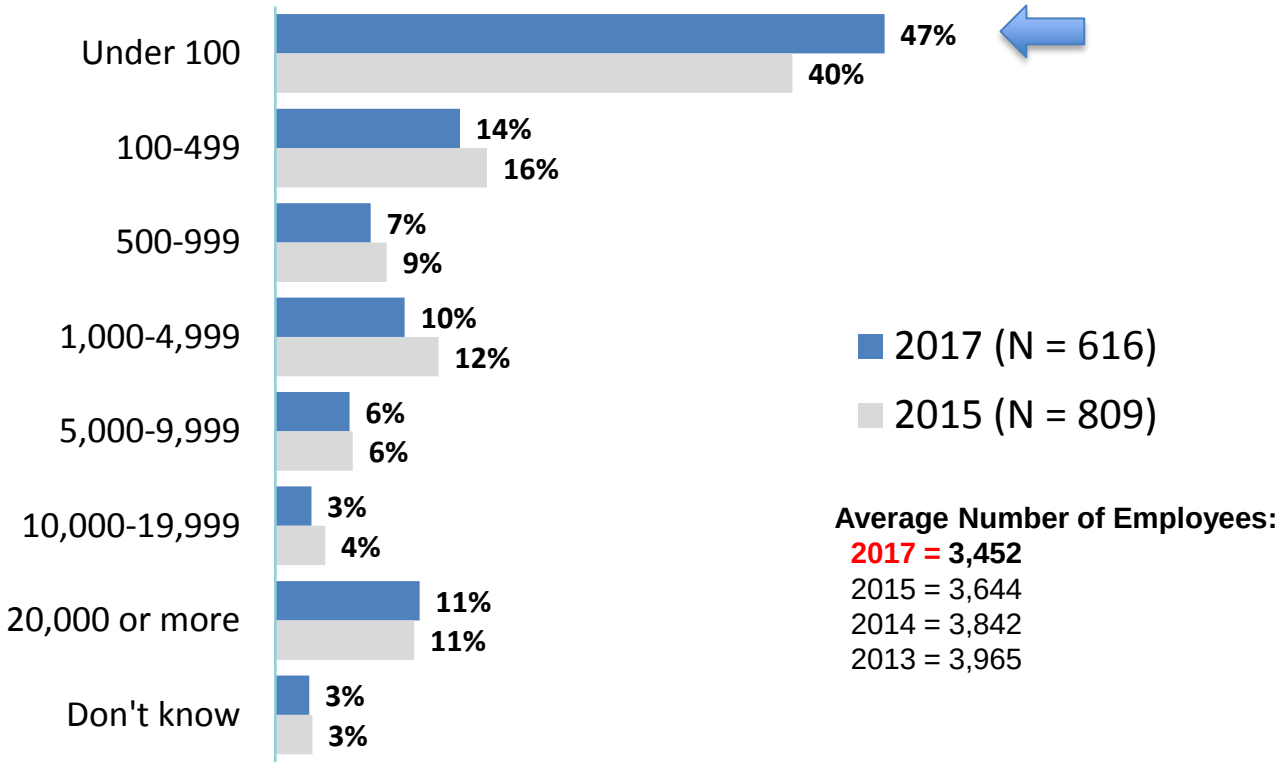
Purpose and Methodology

- **Purpose:** To profile the findings of the 2017 results of EETimes/Embedded.com comprehensive survey of the **embedded systems markets worldwide**. Findings include types of technology used, all aspects of the embedded development process, IoT and innovative technologies emergence, tools used, work environment, applications, methods/ processes, operating systems used, reasons for using chips and technology, and brands and chips being considered by embedded developers. Many questions in this survey are trended over three to five years, but in 2016 the survey was not conducted, so there is no data from that year.
- **Methodology**: A web-based online survey instrument based on the 2015 annual survey was developed and implemented by independent research company Wilson Research Group on February 20, 2017 through to April 15, 2017 by email invitation.
- **Sample:** E-mail invitations were sent to subscribers to EETimes and Embedded.com and related brands with reminder invitations sent later. Each invitation included a link to the survey and an incentive to participate.
- **Returns:** Data is based on **1,234** valid respondents for an overall confidence of 95% +/-2.8%. Confidence levels vary by question. As a guide, confidence for questions with:
  - **1,234 respondents for 2017 = 95% +/- 2.8%**
  - **1,807 respondents for 2015 = 95% +/- 2.3%**
  - 1050 respondents = 95% +/- 3.0% (advanced research industry norm = very high confidence)
  - 600 respondents = 95% +/- 4.0% (intermediate research industry norm = strong confidence)
  - 400 respondents = 95% +/- 5.0% (basic research industry norm = good confidence)

In which region of the world do you reside?



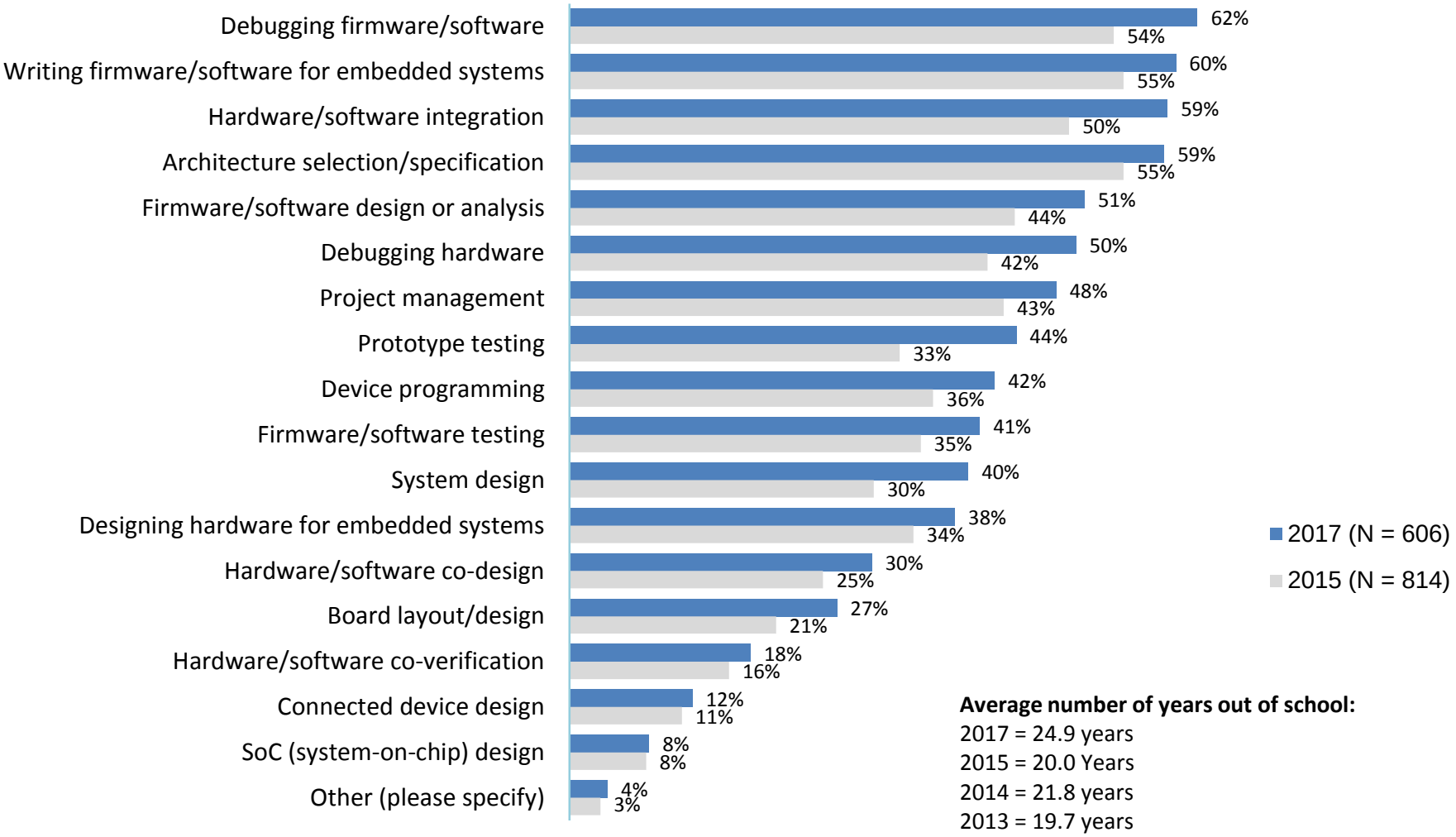
How many employees does your company have at all locations?



Average Number of Employees:

2017 = 3,452
2015 = 3,644
2014 = 3,842
2013 = 3,965

Job Functions



Average number of years out of school:

2017 = 24.9 years
2015 = 20.0 Years
2014 = 21.8 years
2013 = 19.7 years

For what types of applications are your embedded projects developed?

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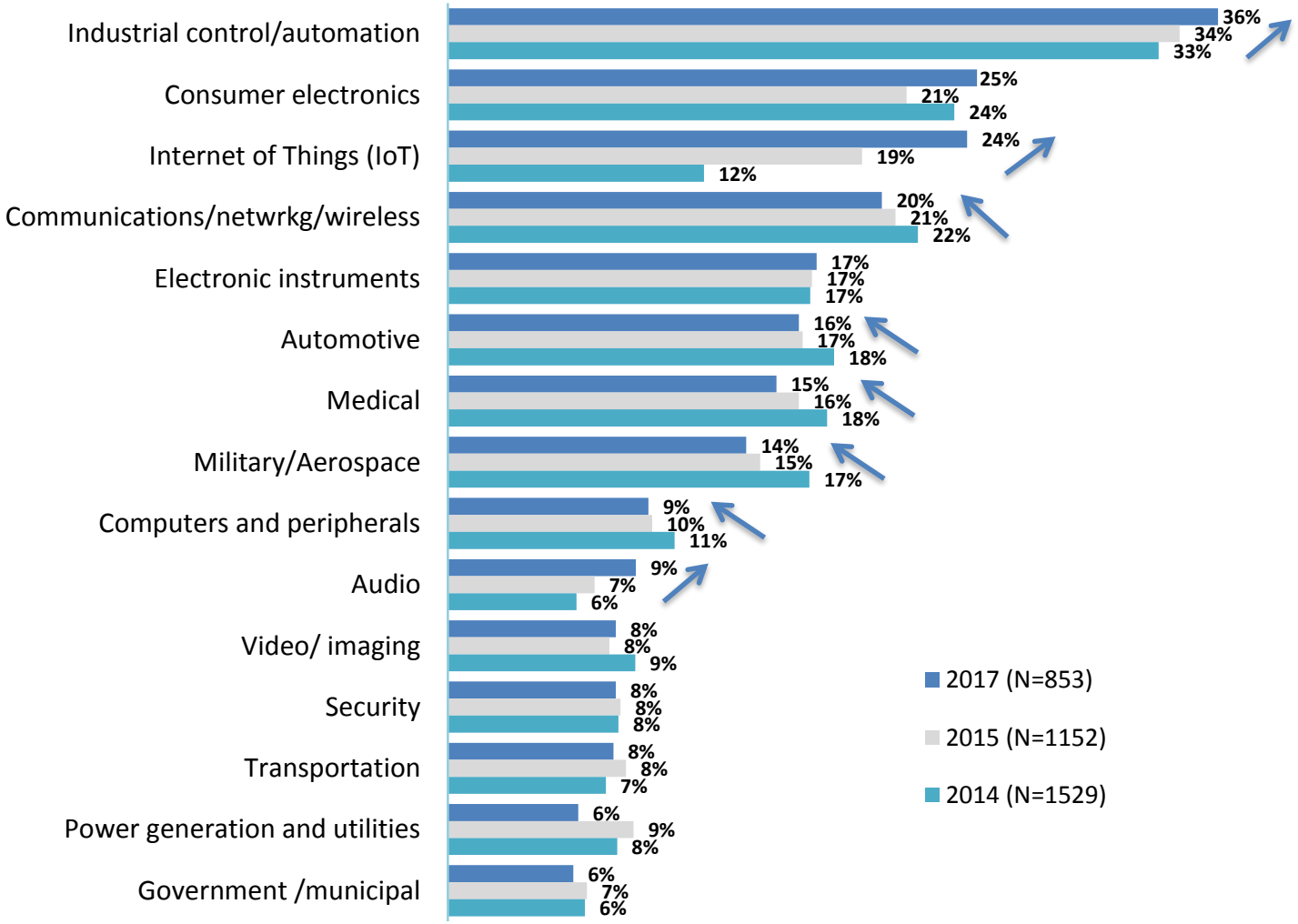
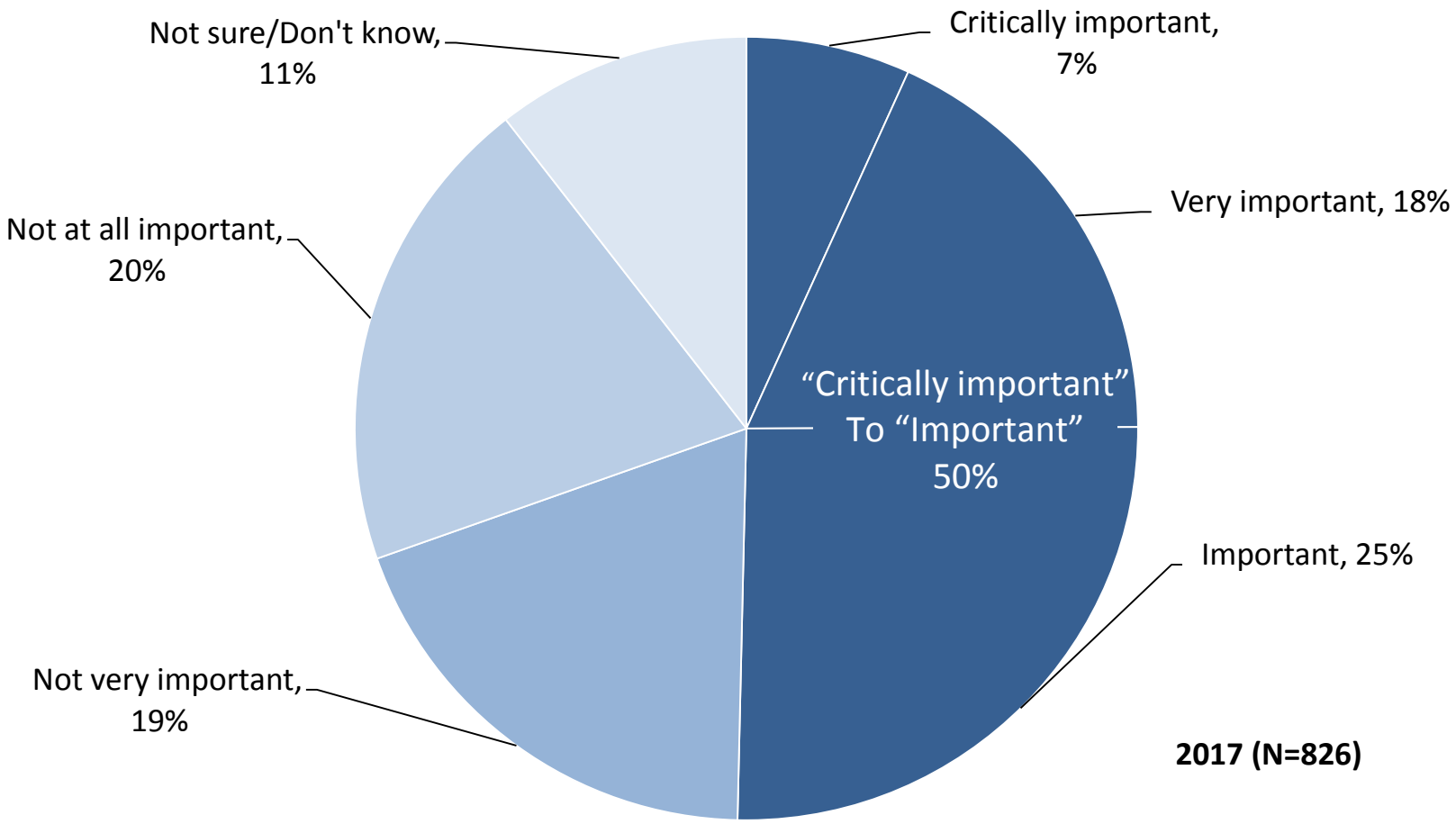
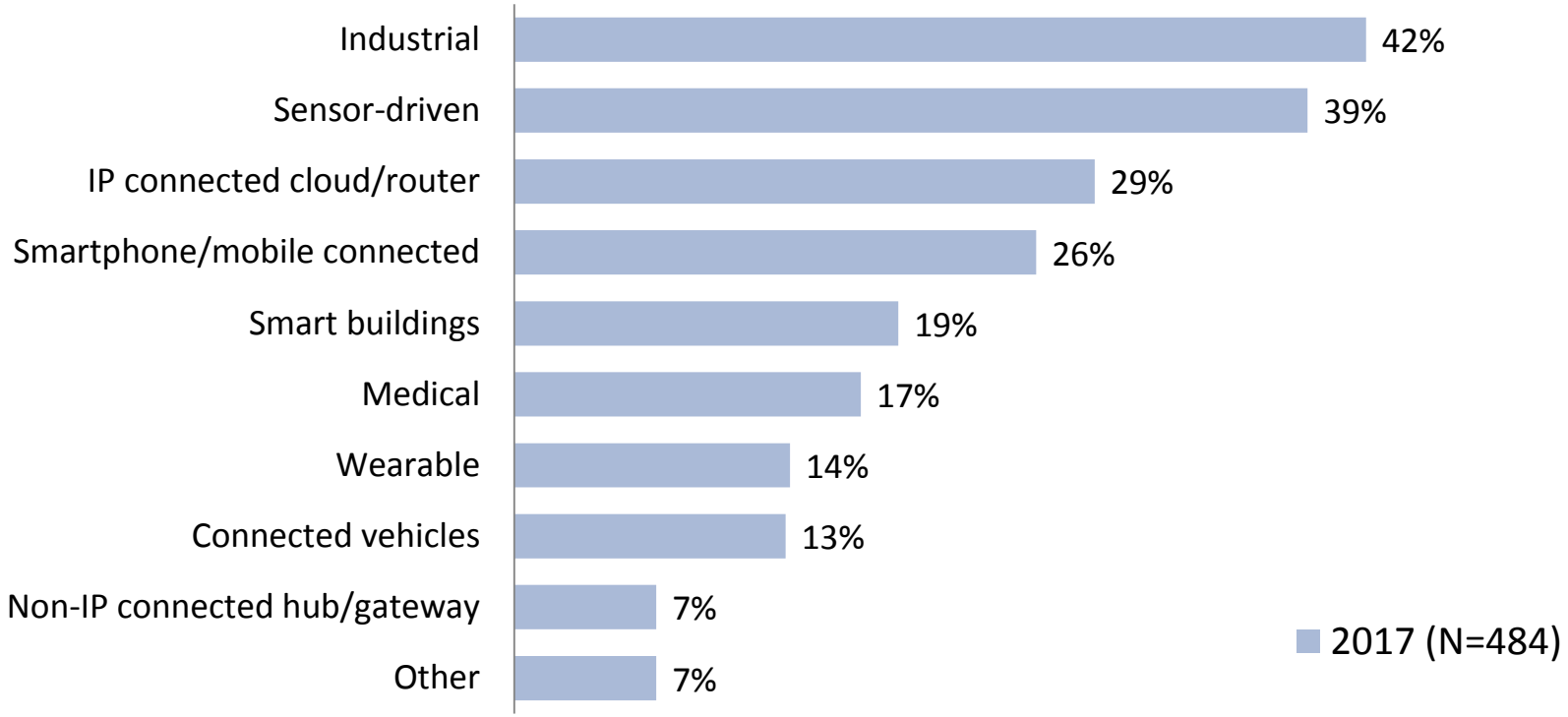


NEW IN 2017

How important will IoT development be to you and your organization in the next 12 months?

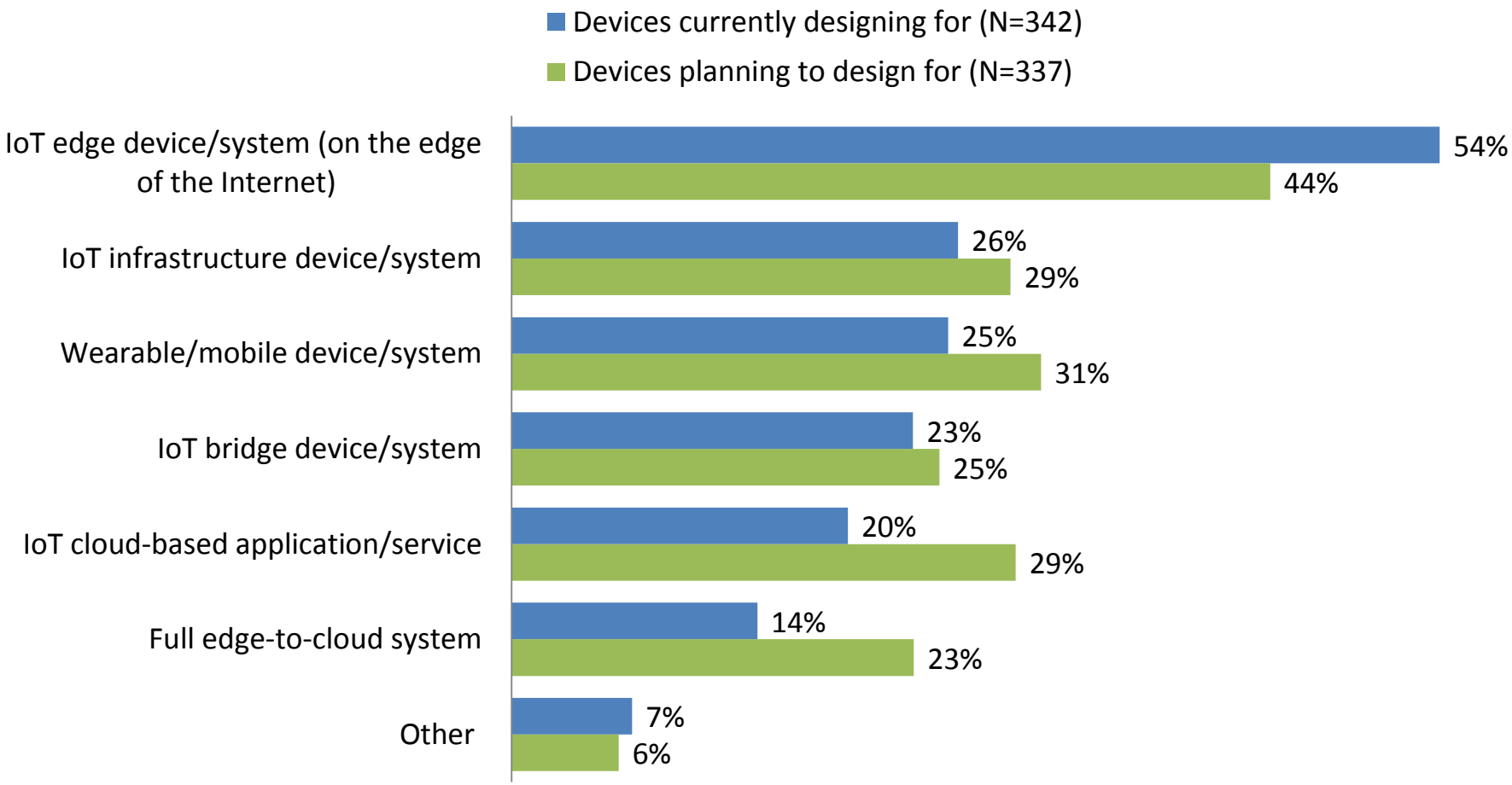


If you are developing Internet of Things (IoT) applications, please indicate the type of application.



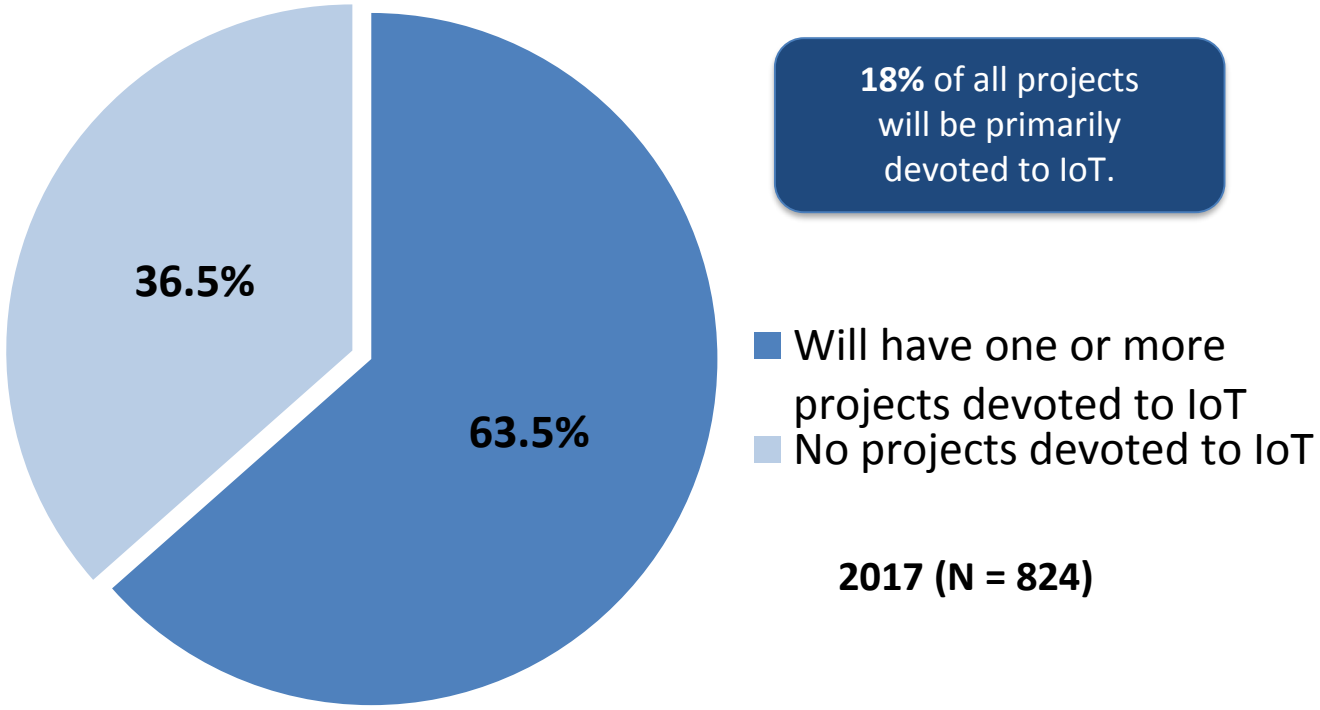
NEW IN 2017

If you are creating Internet of Things (IoT) devices, please indicate the types of devices you are currently designing, and considering for your next design.



NEW IN 2017

Will have one or more projects devoted to IoT.



18% of all projects will be primarily devoted to IoT.

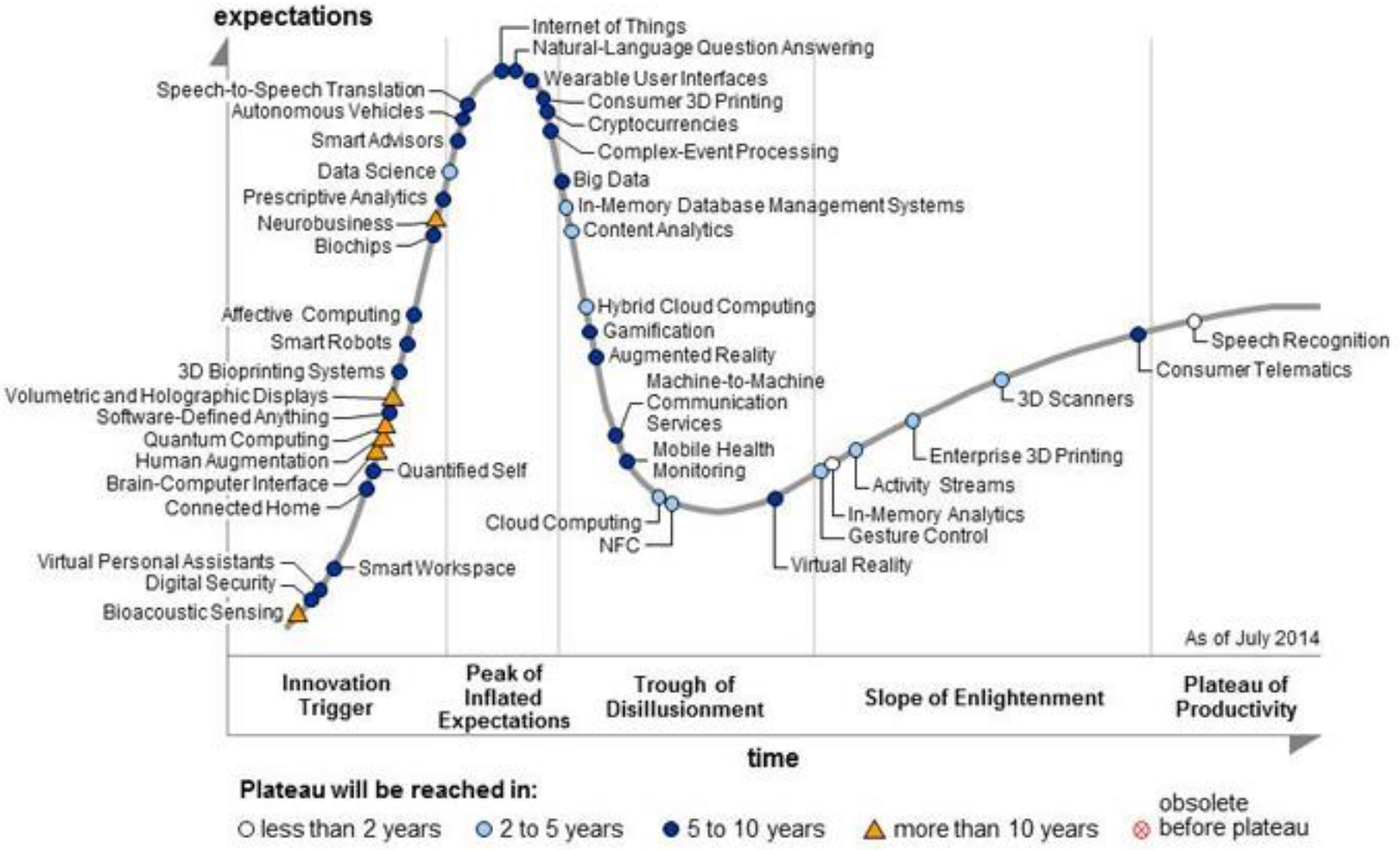
2017 (N = 824)

NEW IN 2017

Considering all applications of which you are aware, what do you regard as the most interesting use of the IoT? (Selected write-in responses).

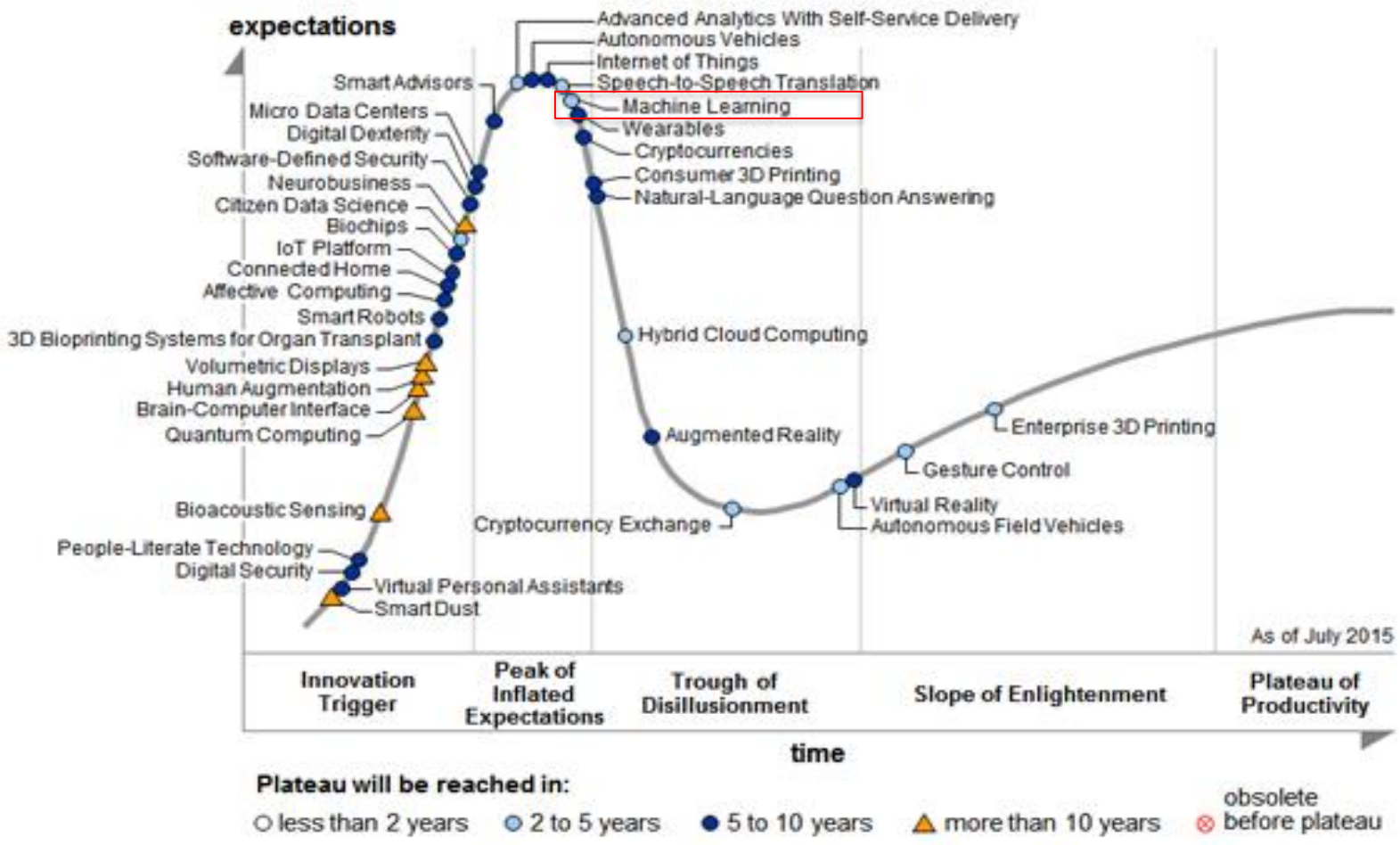
- *Automatic **traffic control.***
- *Connected automated **houses/buildings.***
- *Connected/autonomous **vehicles.***
- *Detecting location: providing **original content** by screen, audio, phone.*
- *Distributed sensing for diagnostics and control. Think of sensors that **detect bearing. failures in rotating machinery, bridges, roadways, factory lines** etc.*
- *Environment monitoring/ global electrical **energy consumption reduction.***
- *Intelligent industrial machines, **predictive maintenance** of industrial components.*
- ***Medical** information/**diagnostic** integration, medical devices.*
- *Real-time sensing (**road conditions, power grid data, total-plant monitoring**).*
- ***Earthquake/seismic** monitoring signaling building evacuations in time to save lives.*
- ***Drones; remote control** and monitoring.*
- ***Security** within IOT - the technology is totally insecure.*
- *Smart cities, smart factories, **precision agriculture**, pest management in farming.*
- ***Brain waves to control wheelchair** movement. Opportunities endless and scary.*
- *Wireless monitor for **underground** water.*

Gartner Hype Cycle for Emerging Technologies



2014: Machine Learning Not Even on the Radar

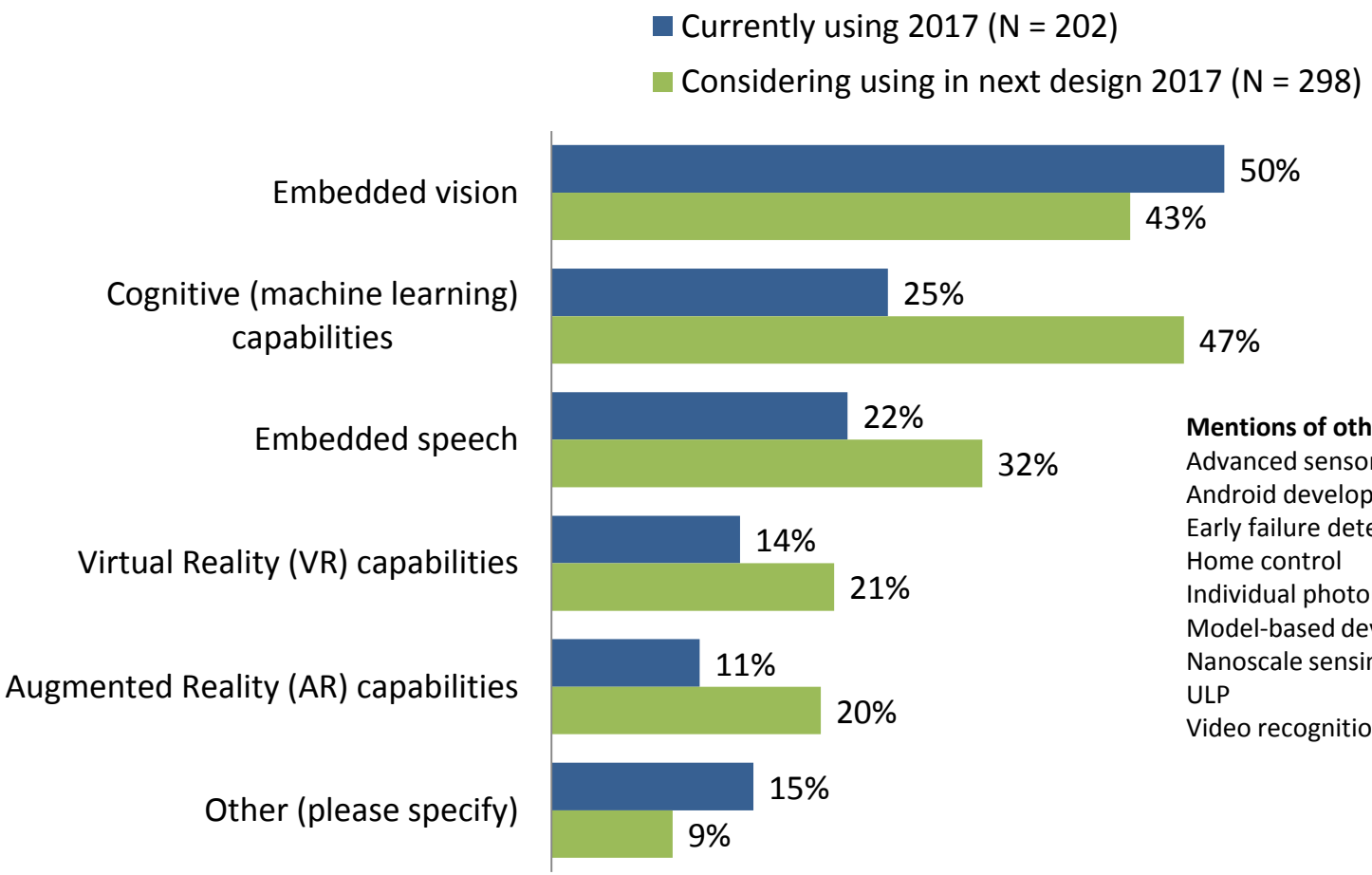
Gartner Hype Cycle for Emerging Technologies



2015: Machine Learning at Peak Hype!

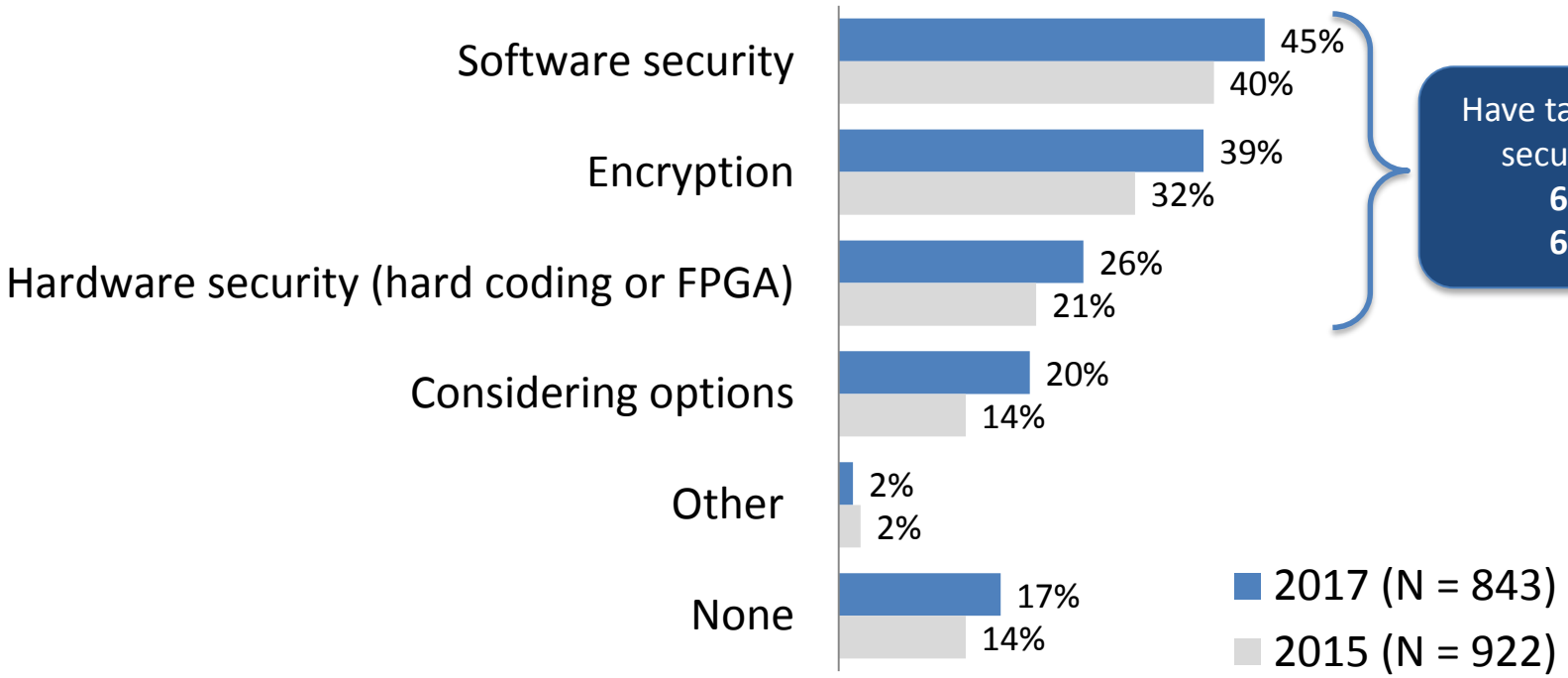
NEW IN 2017

Are you using any of these advanced technologies in your embedded systems?



Mentions of other technologies:
Advanced sensors
Android development for ARM Cortex-M4
Early failure detection
Home control
Individual photon detection
Model-based development
Nanoscale sensing
ULP
Video recognition, voice recognition

What security measures are you taking with your current design?



Overall Background

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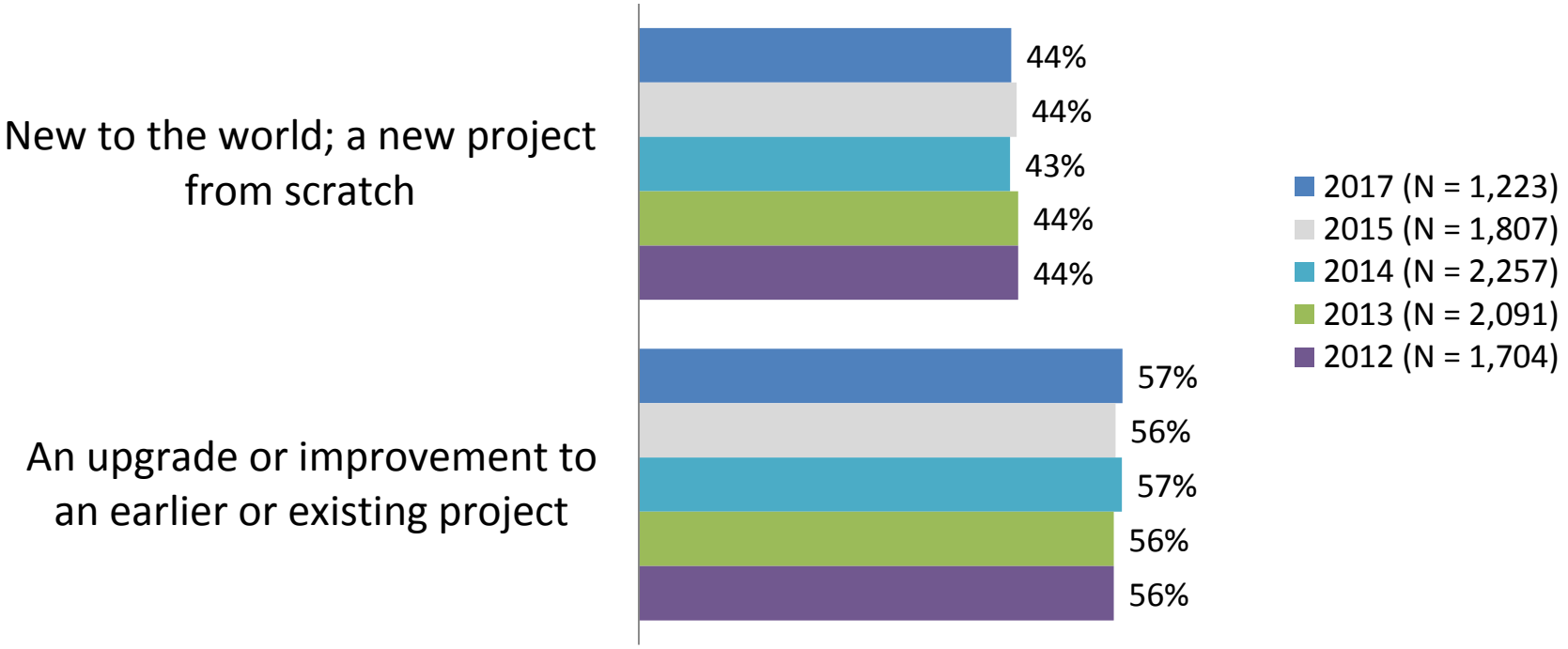
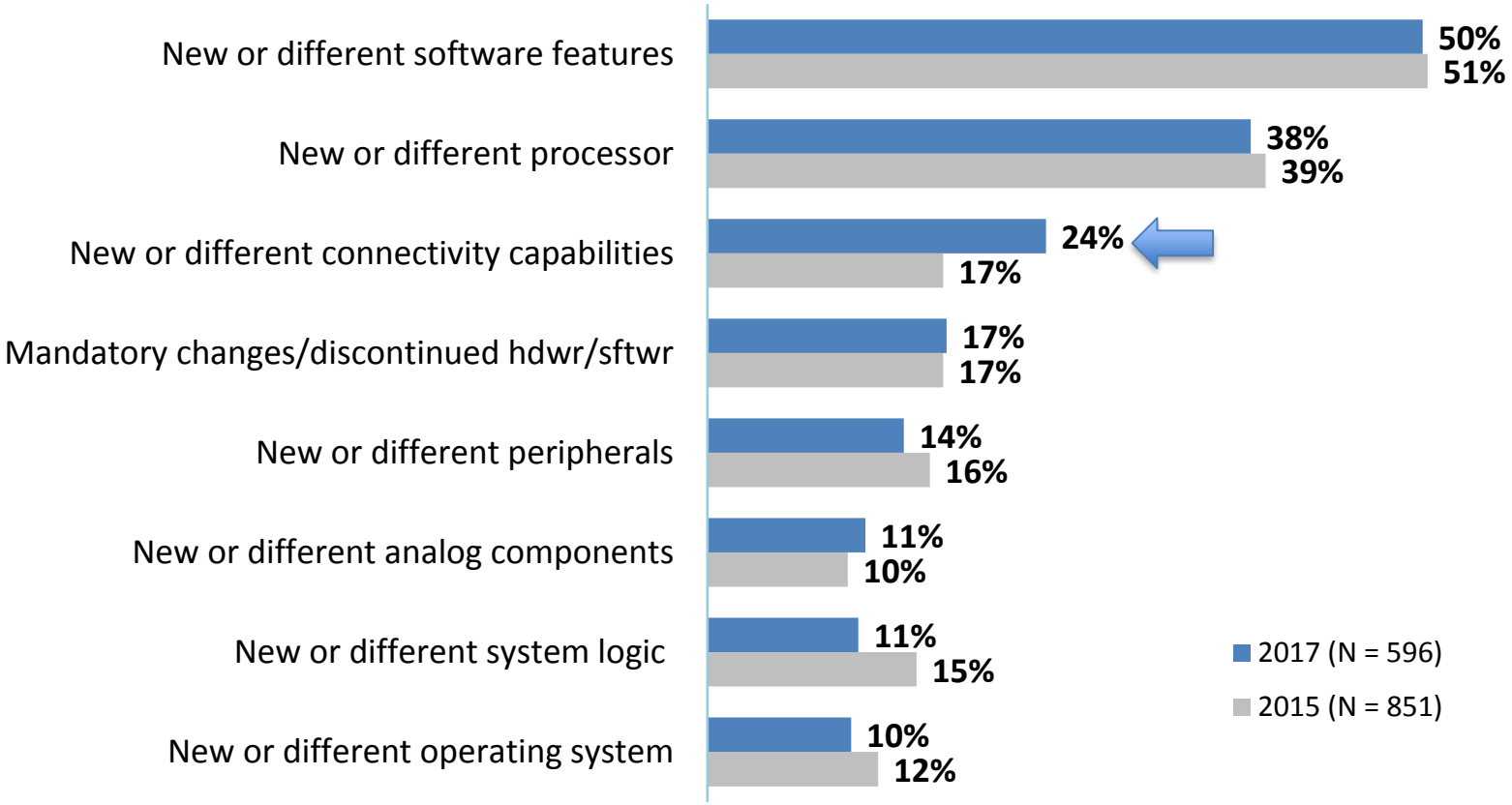
- **Focus –** IoT and Advanced Technologies were given some focus.
- **World Regions –** In this data, US/Canada (56%) are the predominantly represented region, Europe /ENEA (25%) is next, and Asia (11%) is less than in 2015.
- **Company Size –** Average of 3,452 employees is slightly down from 2015.
- **Job functions –** Debugging (62%), writing firmware/software (60%),hardware/software integration (62%), and architecture selection (59%) are the top four job functions.
- **Number of Years Out of School:** Average years out of school for the 2017 is 24.
- **Applications –** Industrial controls (36%) has led applications for many years. Consumer electronics (25%) is holding steady at second. Internet of Things (24%) upticks by leaps and bounds from fourth in 2015 to third place in 2017
- **IoT Usage/Advanced Technologies –** Sensor-driven (42%) and industrial (39%) applications led the IoT field. Half of all users felt IoT designs will be important in the next 12 months. Among advanced technologies used embedded vision technology was used most. Machine learning has greatest potential.
    - 54% are creating IoT edge of the internet devices.
    - 64% will have one or more projects devoted to IoT.
- **Security –** 45% of respondents are taking software security measures, 39% encryption, 26% hardware security measures. 66% are taking one or more of these.

Current Embedded Design Environment

My current embedded project is…

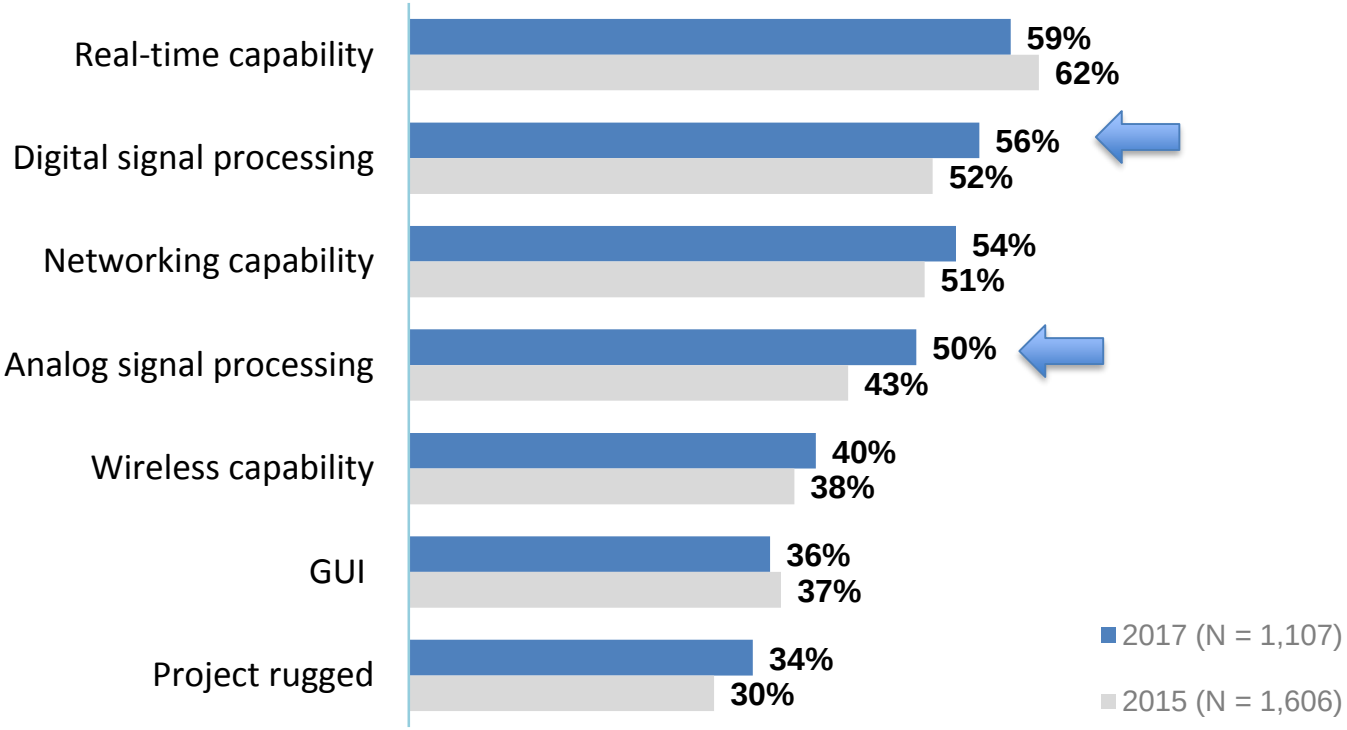


What does the upgrade or improvement include?



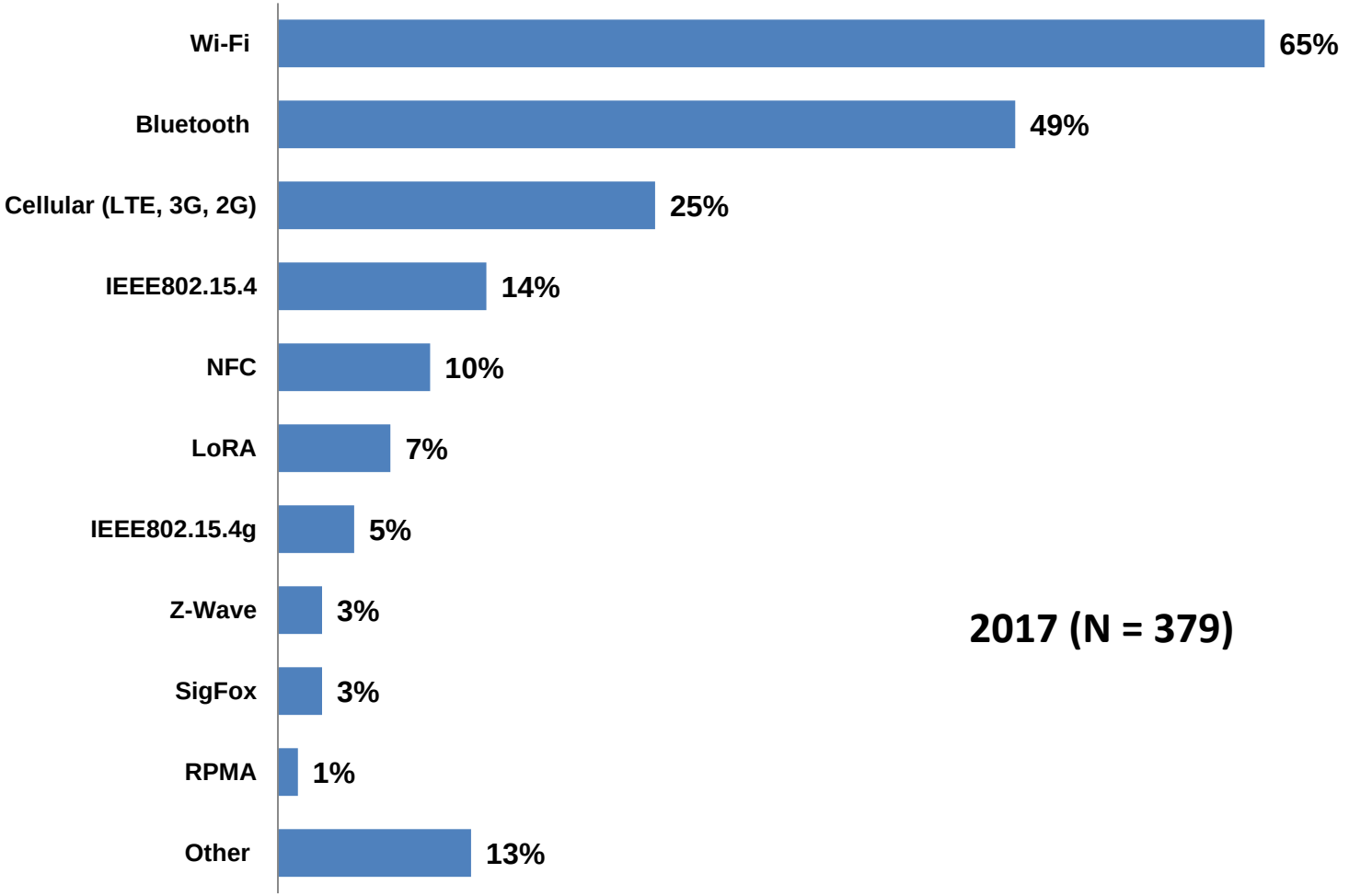
Base = Those whose current project is an upgrade/improvement

Which of the following capabilities are included in your current embedded project?



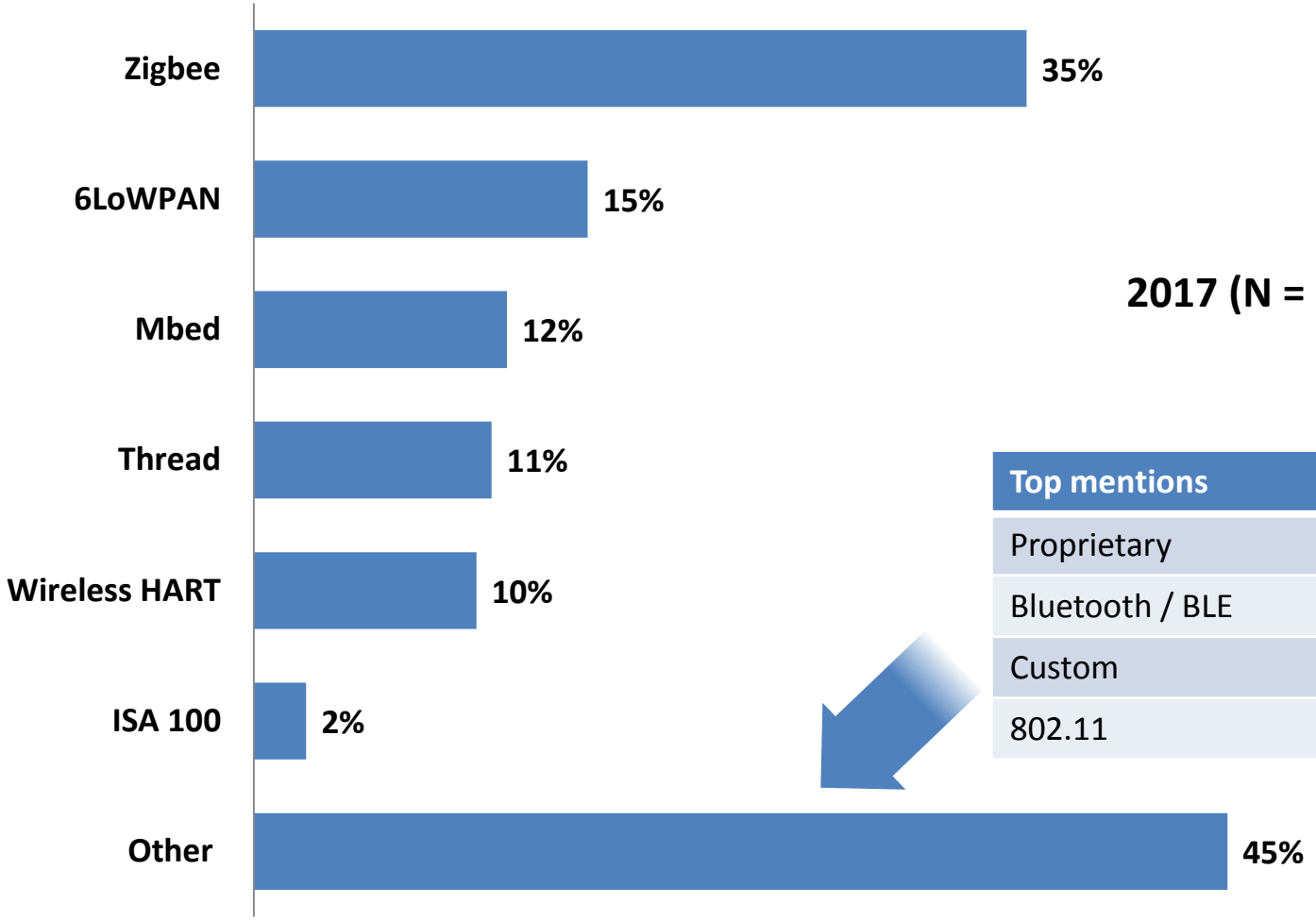
NEW IN 2017

If wireless, what wireless interfaces does your current embedded project include?



NEW IN 2017

If wireless, what wireless protocols/stacks does your current embedded project include?



2017 (N = 294)

Top mentions	#
Proprietary	17
Bluetooth / BLE	15
Custom	10
802.11	5

How many people are on your embedded project team?

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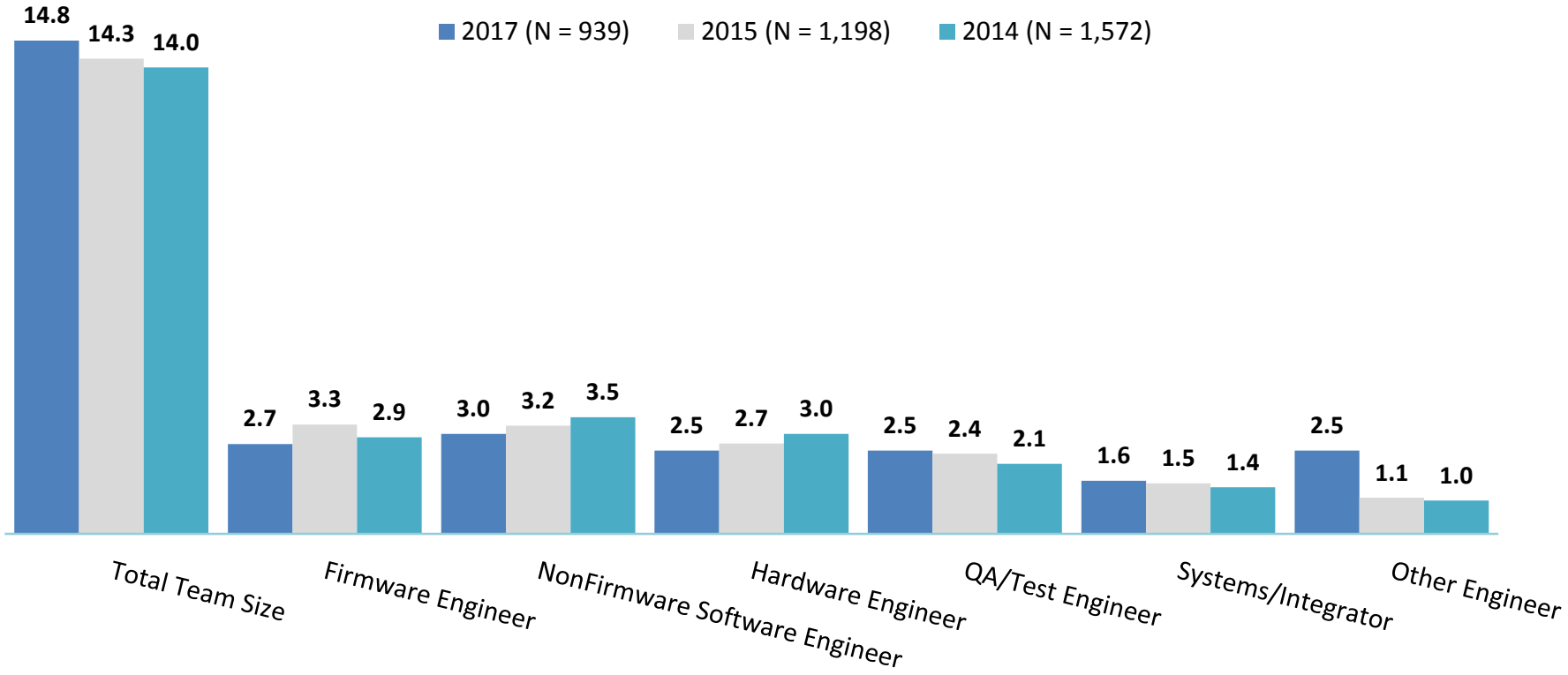
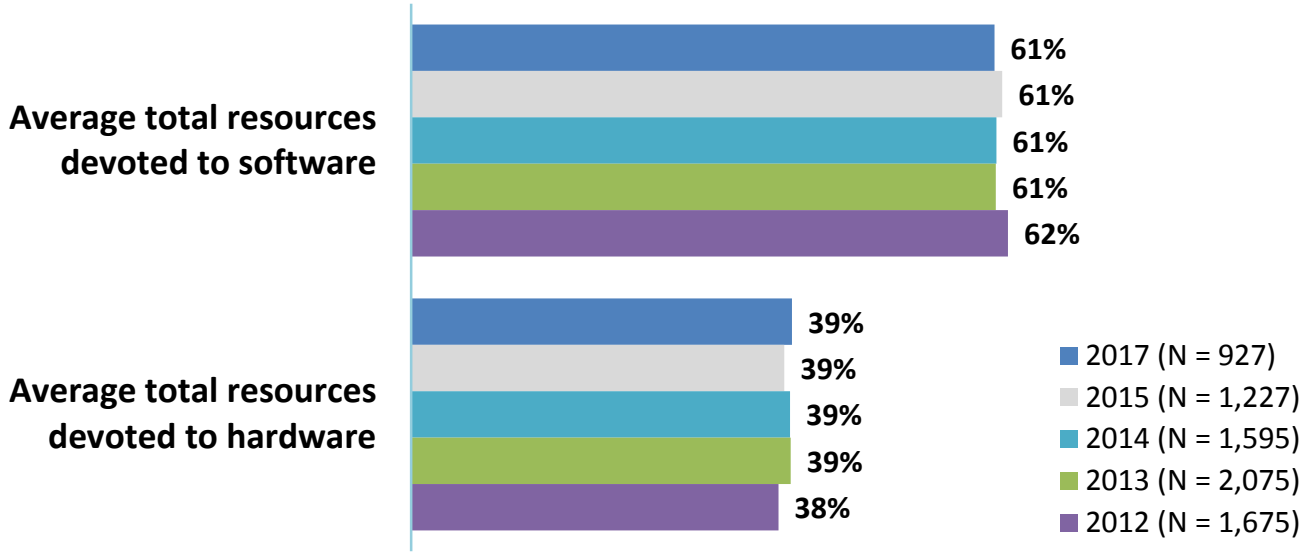
14.8 **engineers per team** is slightly higher than 2015 and 2014.



Note: Outside vendors worked with is 2.7 on average.

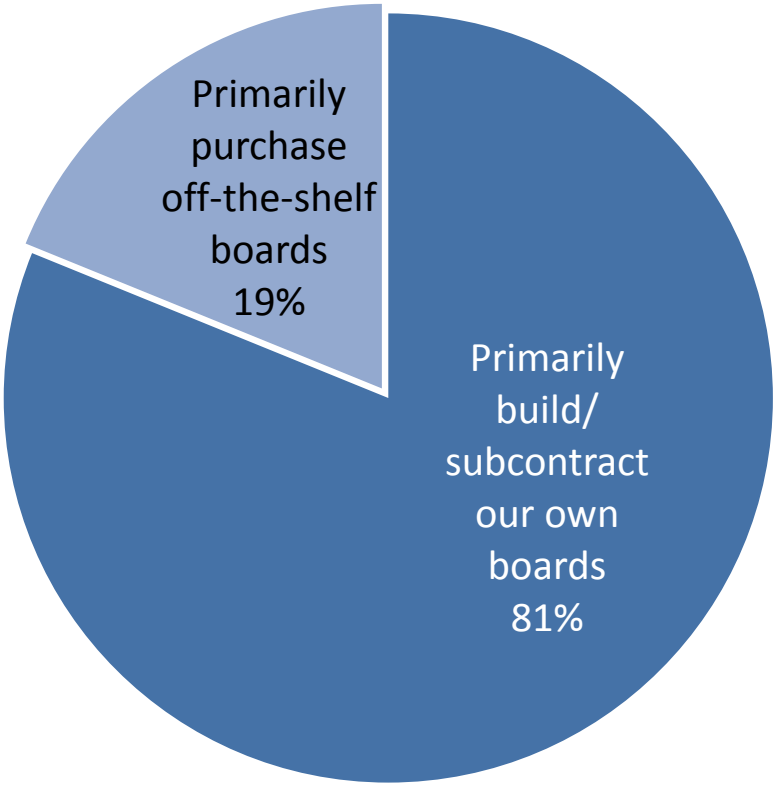
What is your development team's ratio of total resources (including time/dollars/manpower) spent on software vs. hardware for your embedded projects?



Note:
In 2017, respondents averaged working on 2.1 projects at the same time.
In 2015, respondents averaged working on 2.1 projects at the same time.
In 2014, respondents averaged working on 2.0 projects at the same time.

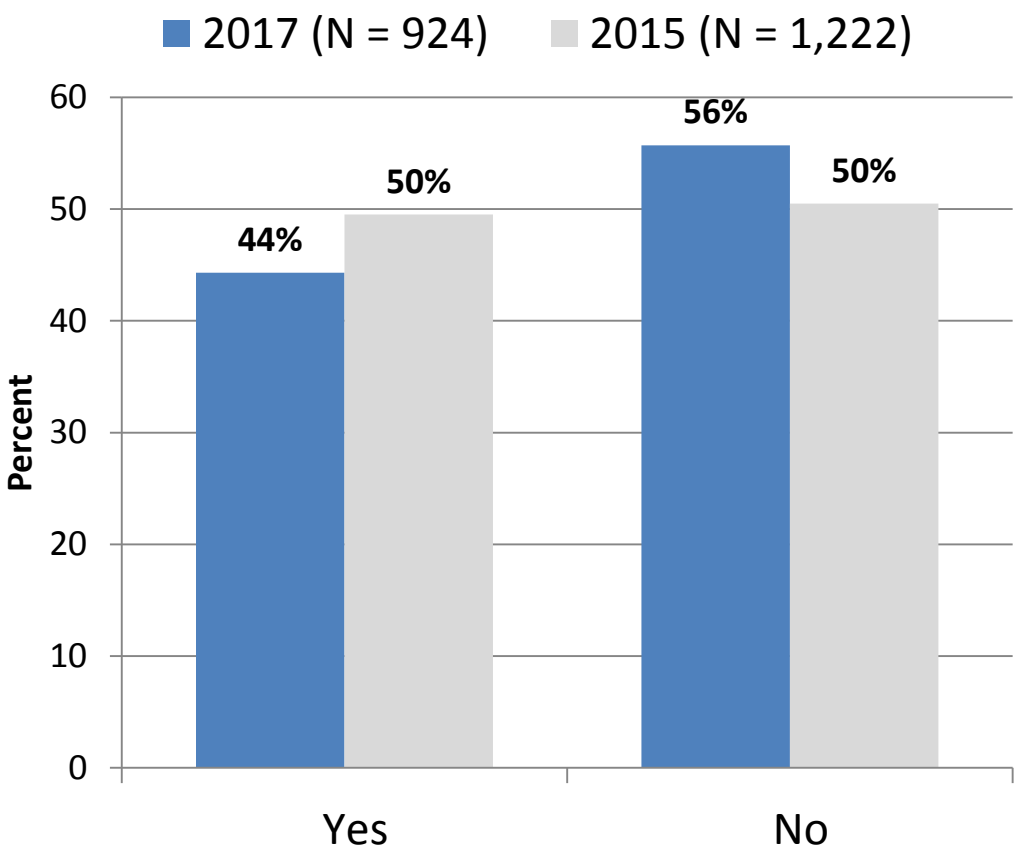
NEW IN 2017

Do you primarily design or subcontract the design of custom circuit boards, or do you purchase off-the shelf boards?



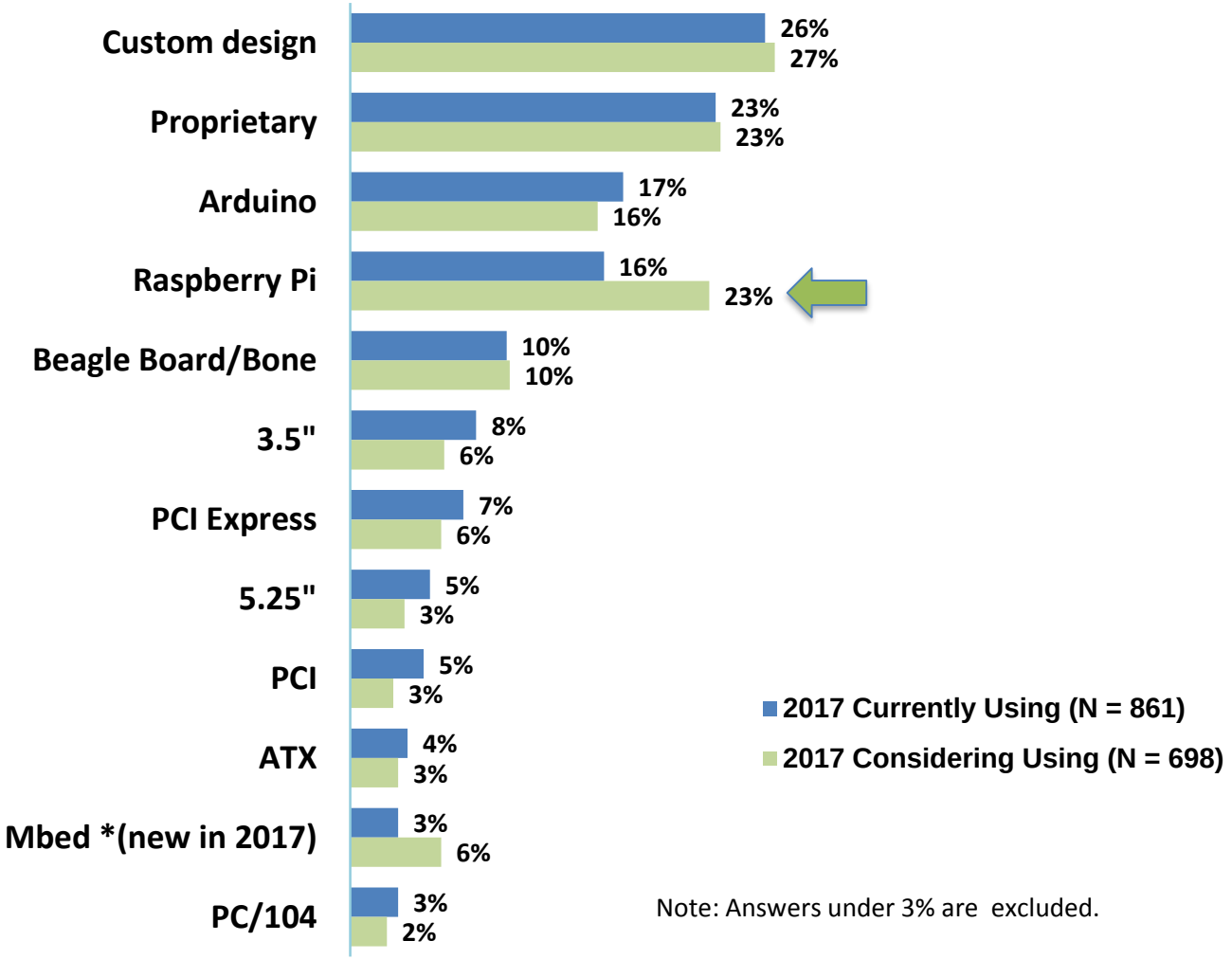
2017 (N=923)

Did you start your current embedded design with a development board?



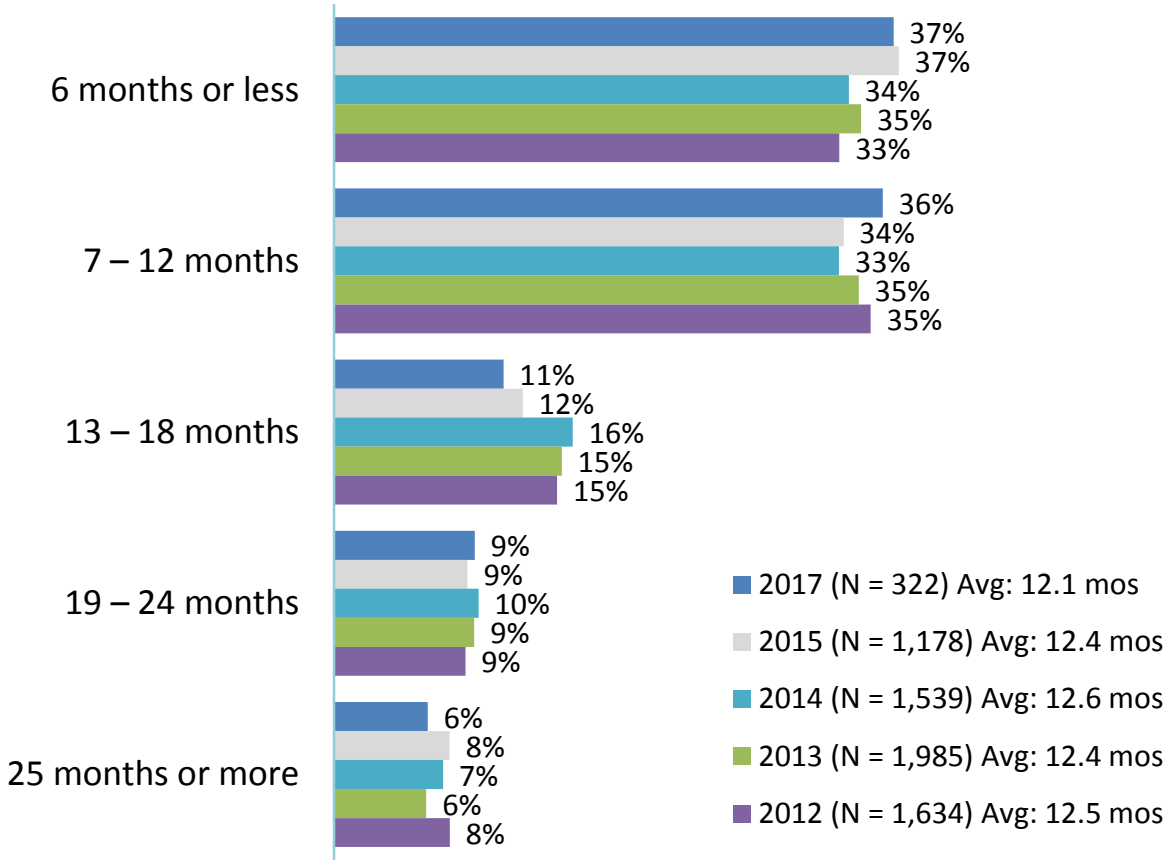
Development Board Started With (Write-in Answers Only)	N=356	Percent
ST Microelectronics	38	10.7%
TI (LaunchPad=5)	38	10.7%
Xilinx	29	8.1%
NXP	26	7.3%
Microchip	21	5.9%
Arduino	20	5.6%
Rasberry Pi	15	4.2%
BeagleBoard Bone Black	12	3.4%
Atmel	10	2.8%
Freescale (NXP)	10	2.8%
Cypress kits	6	1.7%
Renasas	6	1.7%
Altera Stratix V DSP Kit	5	1.4%
Avnet	5	1.4%
Intel Edison	5	1.4%
Silicon Labs	4	1.1%
Digi	3	0.8%
ESP32	3	0.8%
MSP430 - TI	3	0.8%
Nordic/nRF52-DK	3	0.8%

Which form factor boards are you currently using, and considering using ?

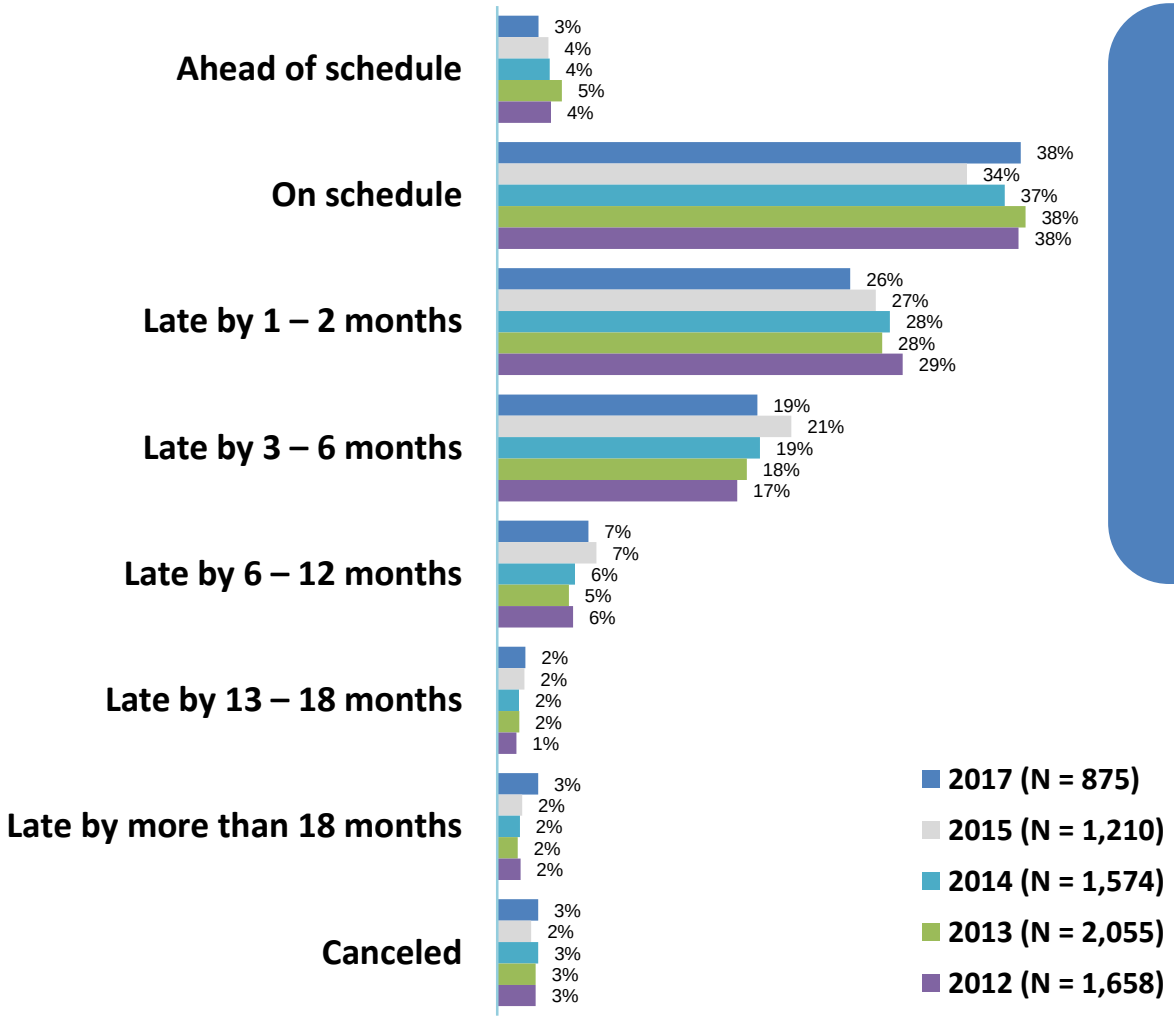


Note: Answers under 3% are excluded.

Thinking now about the last embedded project you completed (no longer in development), how many months did that project take to finish?



Was that project completed . . .

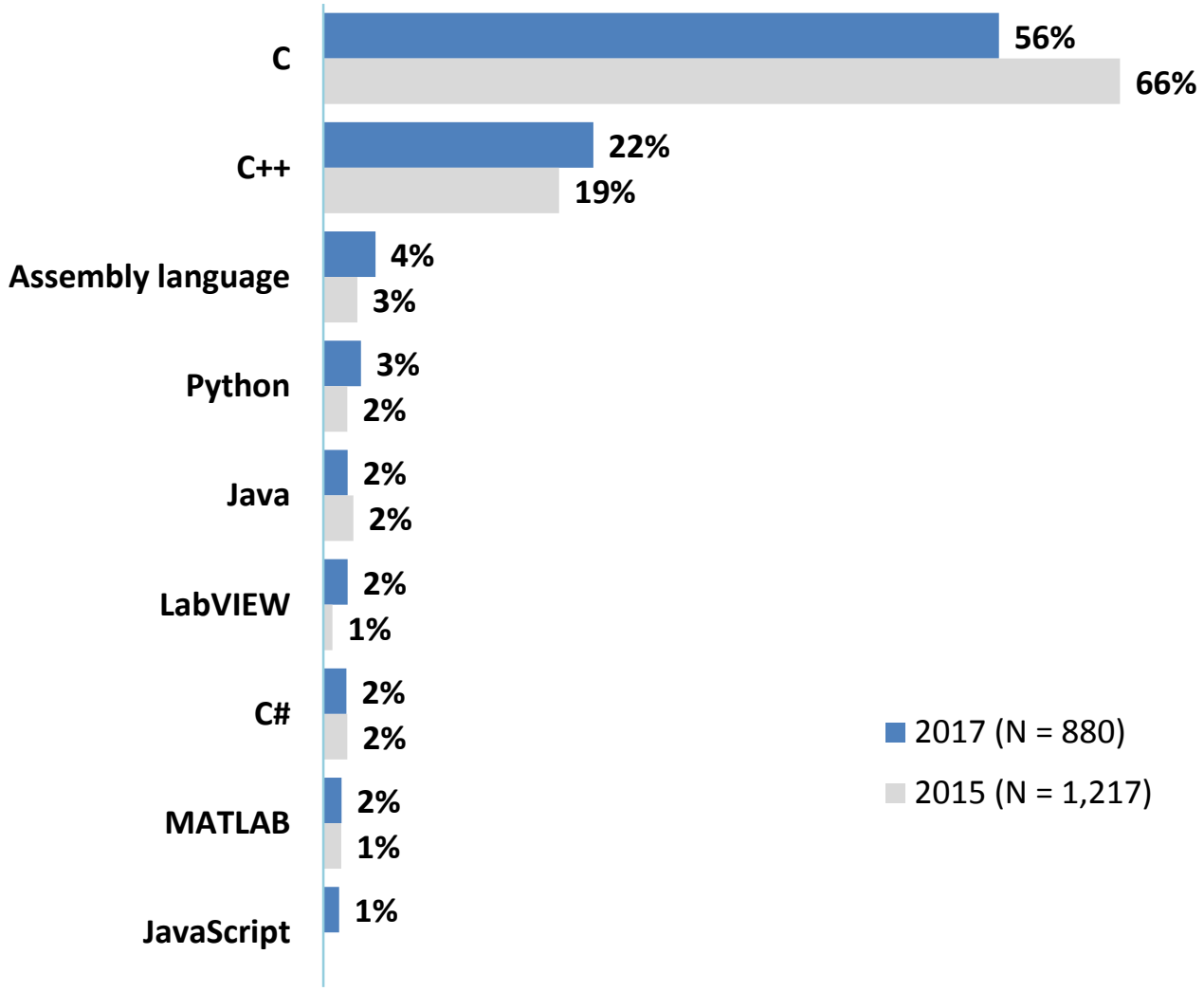


In 2017, 41% of all projects finished "ahead of" or "on" schedule, and 59% finished "late or cancelled".

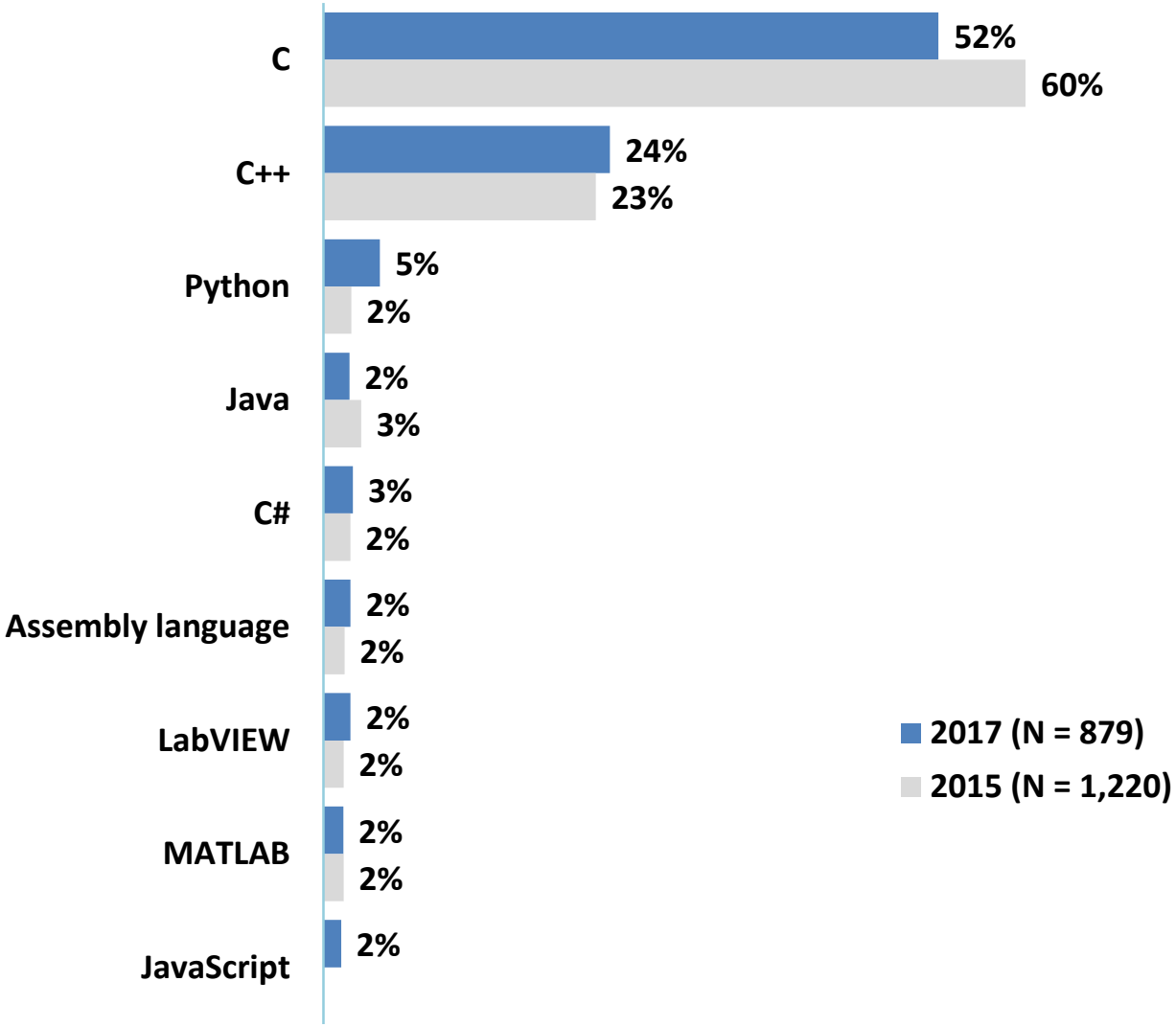
In 2015, 38% of all projects finished "ahead of" or "on" schedule, and 62% finished "late or cancelled".

2017 performance has returned to the performance levels of the 2012-2014 that averaged 41%-44% "on/ahead of" schedule.

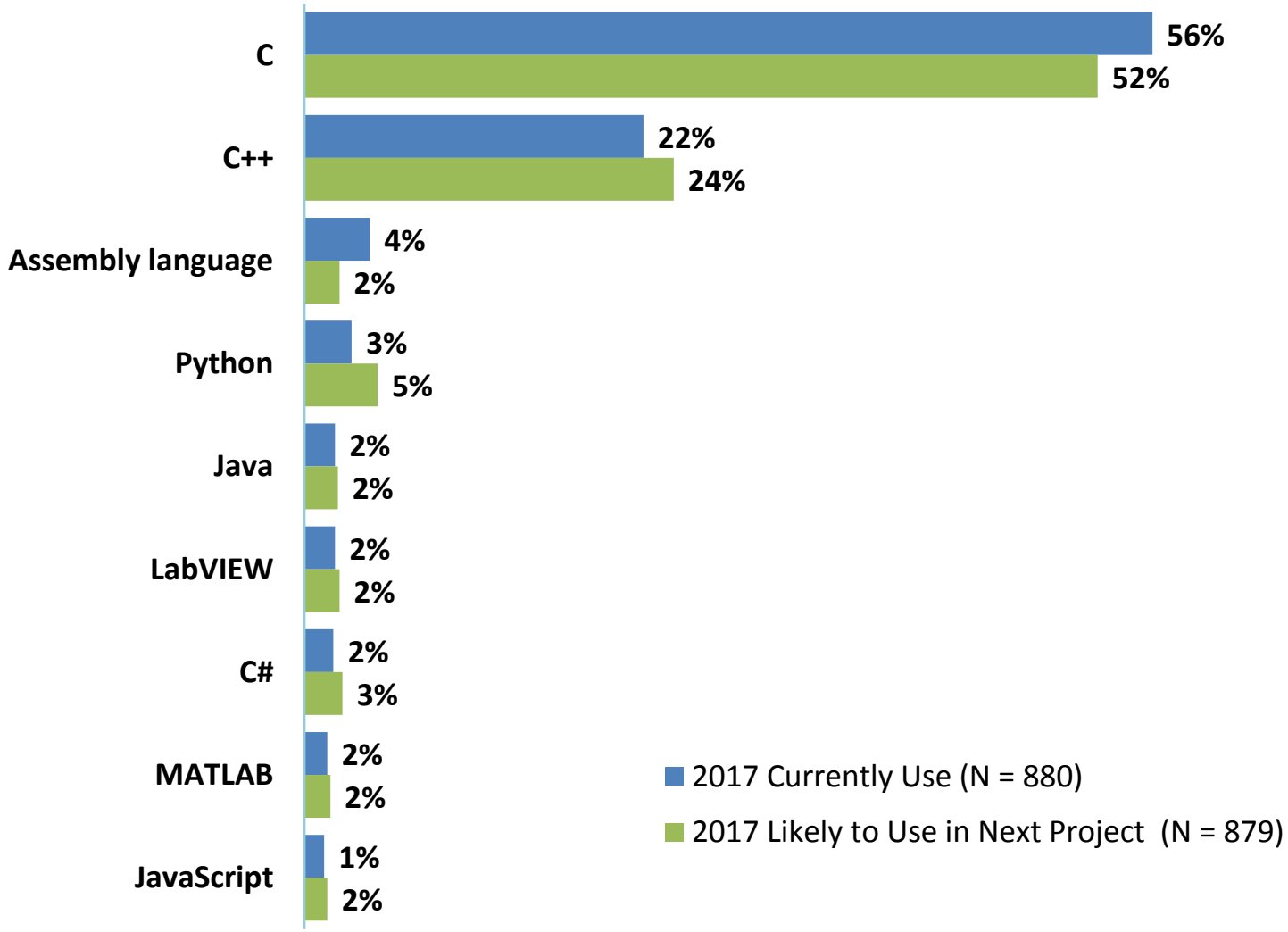
My current embedded project is programmed mostly in:



My next embedded project will likely be programmed mostly in:



Current languages used compared to next project's likely language.



Does your current project reuse code from a previous embedded project?

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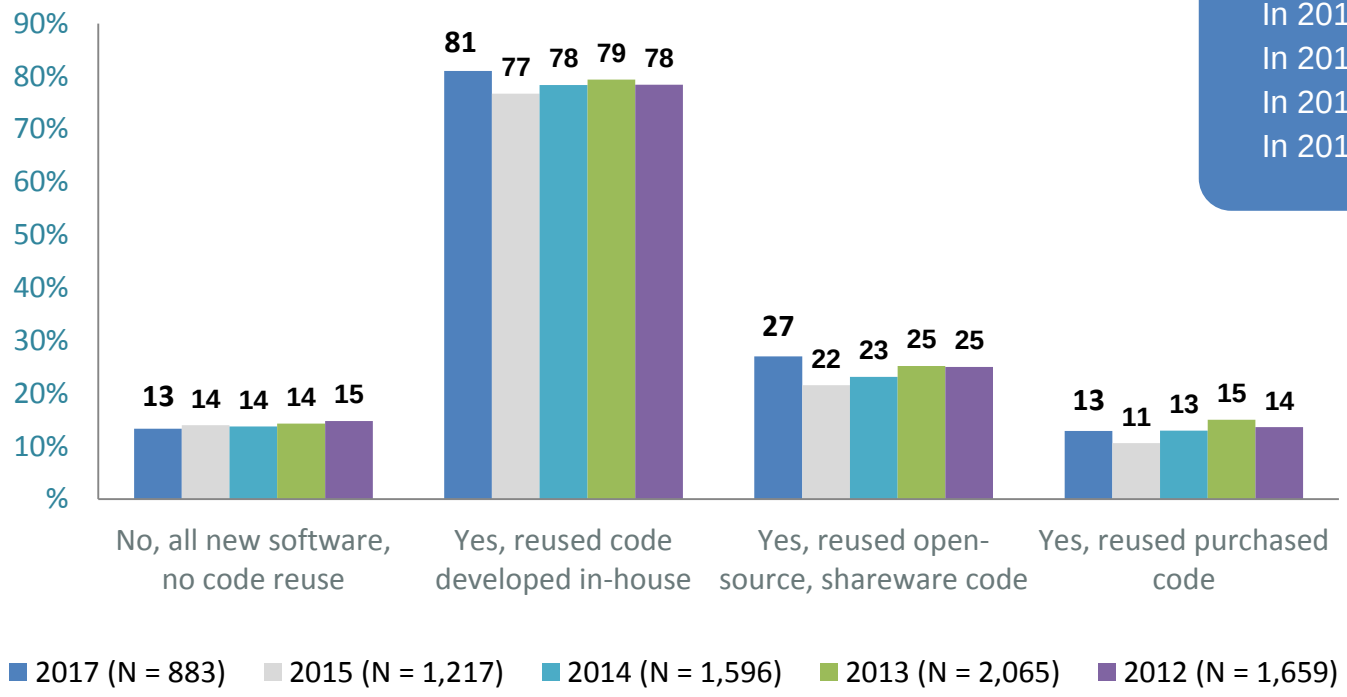
In 2017, 87% reused code.
In 2015, 86% reused code.
In 2014, 86% reused code.
In 2013, 86% reused code.
In 2012, 85% reused code.



Note 1. Multiple choice for "Yes" answers (a respondents can select more than one type of reused code).
Note 2. 76% of respondents also reused hardware or hardware IP.

Embedded Design Environment

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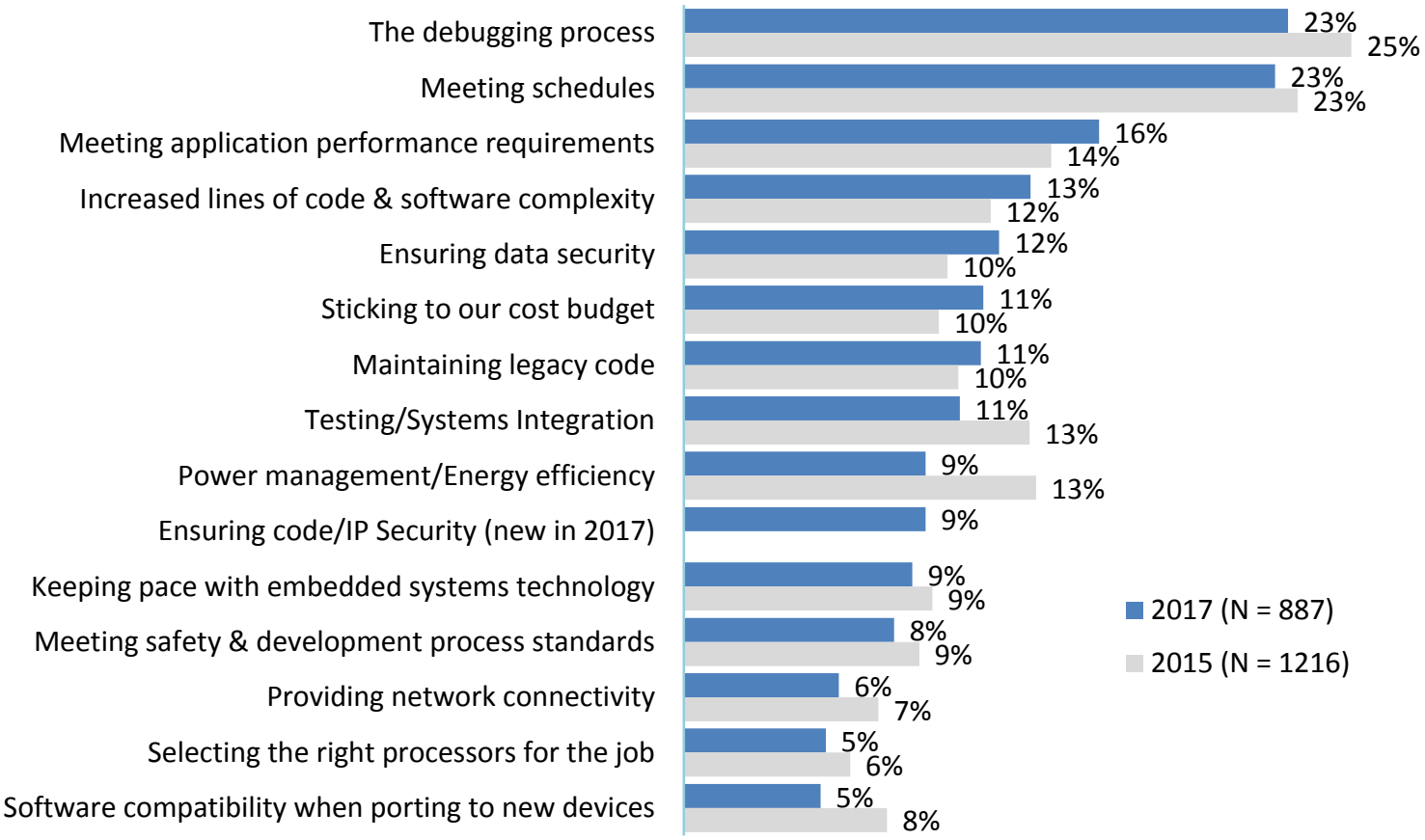
- **Upgrades vs. New –** 56% upgrades, 44% new projects – five years going.
  - Upgrades include new software features, processors, connectivity.
- **Capabilities –** Real time (59%), DSP (56%), networking capabilities (54%).
- **Team Size –** 14.8 is up from 14.0 three years ago.
- **Outside vendors –** Work with an average of 2.7 outside vendors.
- **Resources Used On –** Software (61%), hardware (39%).
- **Projects Worked On at Same Time –** Average of 2.1 projects.
- **Build or Purchase Boards –** 81% build their own boards, 19% purchase OTS.
- **Project Starts with Board –** 44% is down from 50% in 2015.
- **Form Factor Boards Used –** Custom design (26%), proprietary (23%) top two.
- **Months to Complete Project –** 12.1 months on average, down from 12.4.
- **On or ahead of schedule –** 41% in 2017 is two ticks better from 2015.
- **Languages –** C usage at 52%, down some but still dominant. No challengers.
- **Recode Use –** 87% was close to 2015 (86%), and is expected to continue

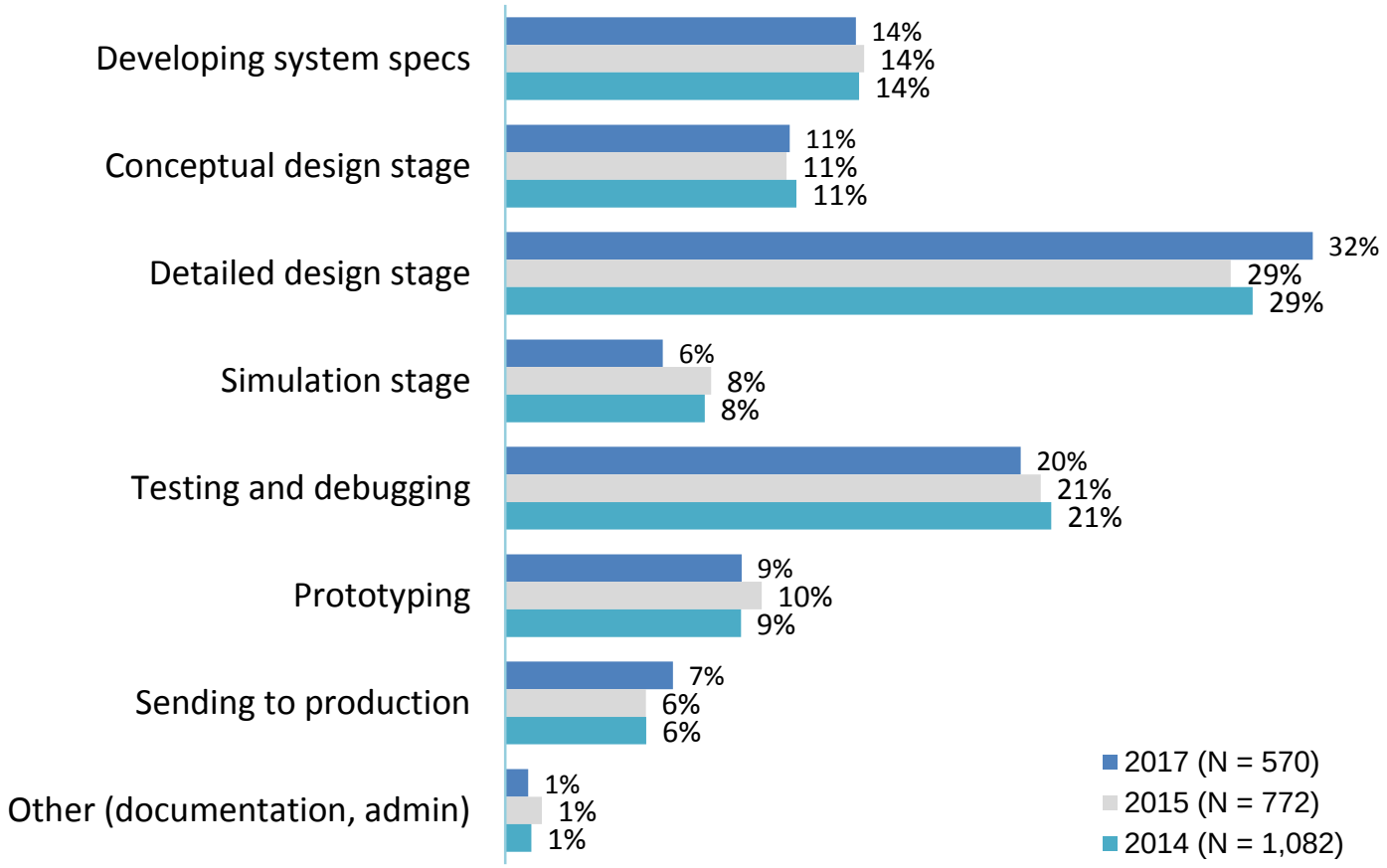
Embedded Design Process

Which of the following challenges are your own or your embedded design team's greatest concerns regarding your current embedded systems development?

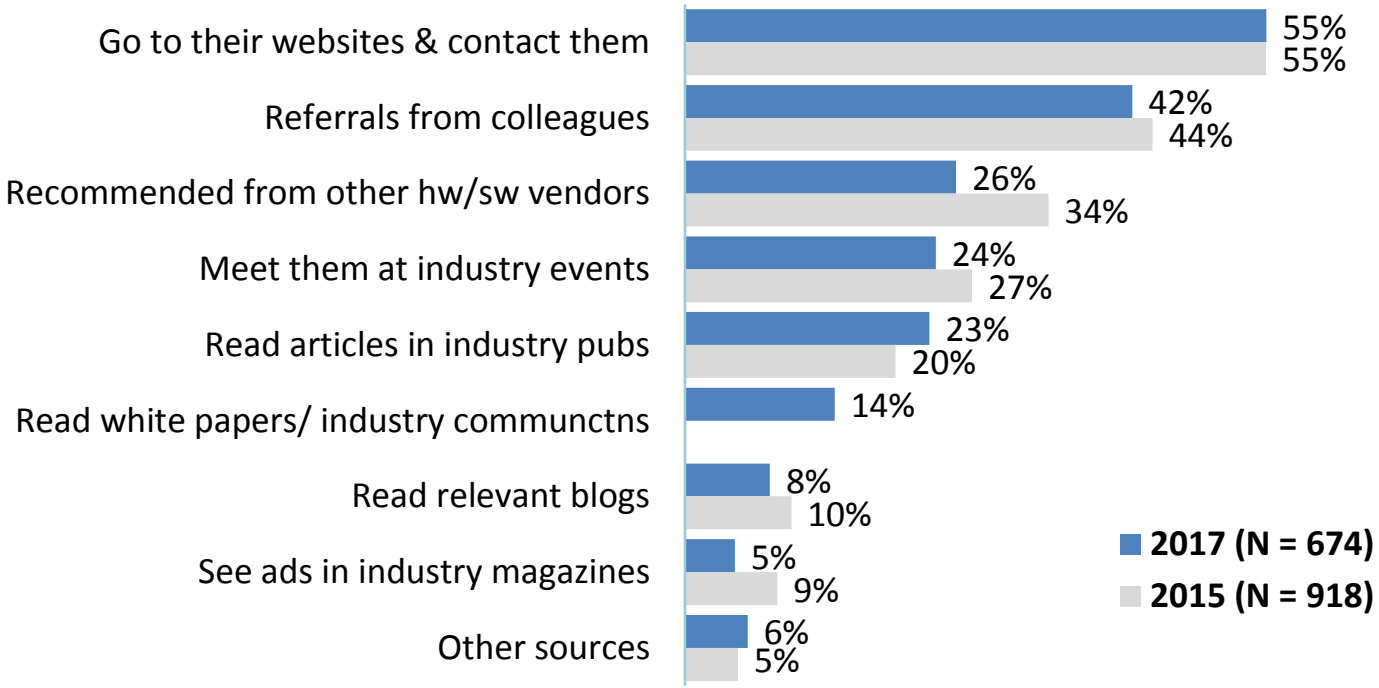


** Added in 2015*

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



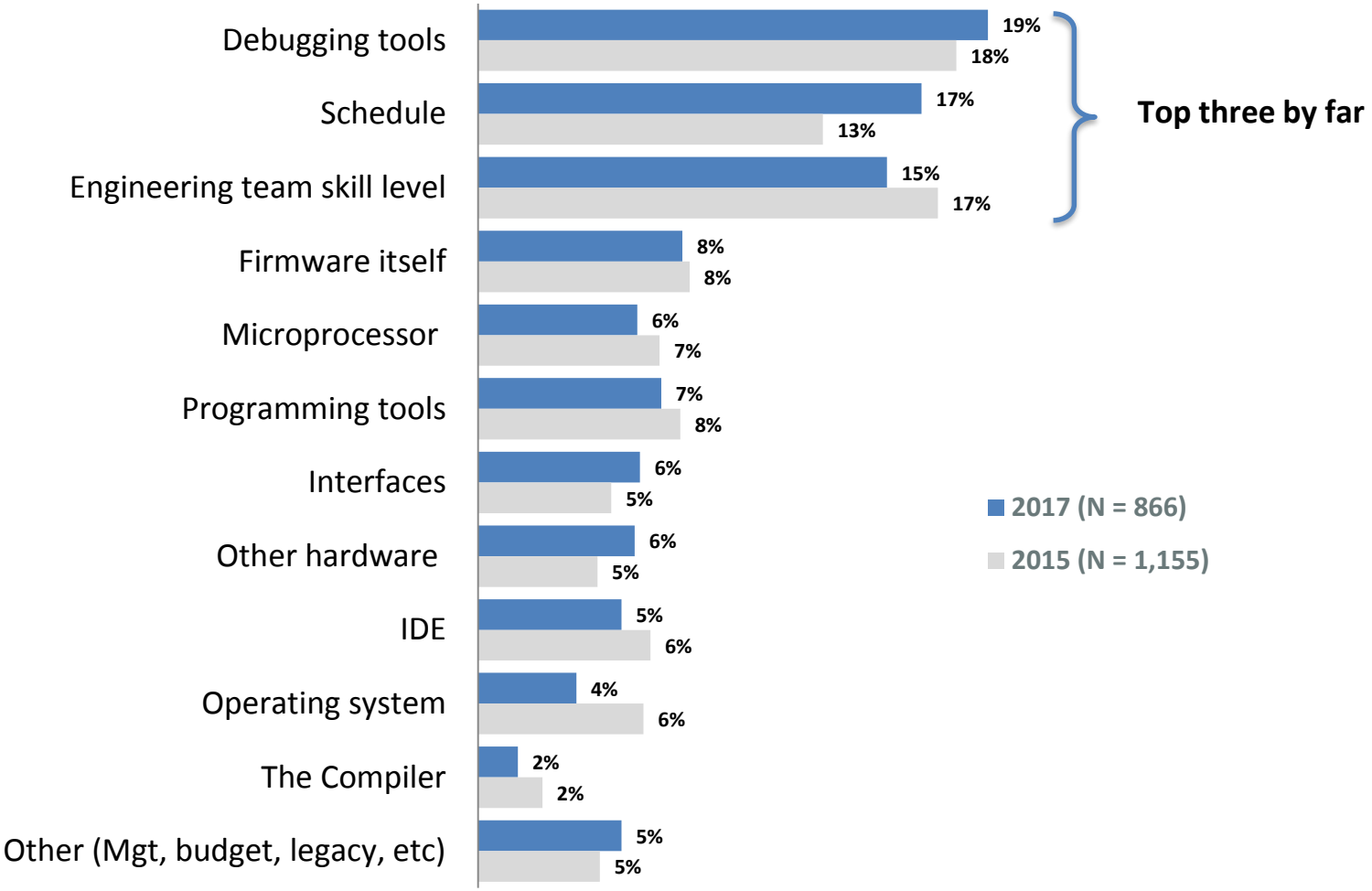
How do you typically find and evaluate partners to work with?



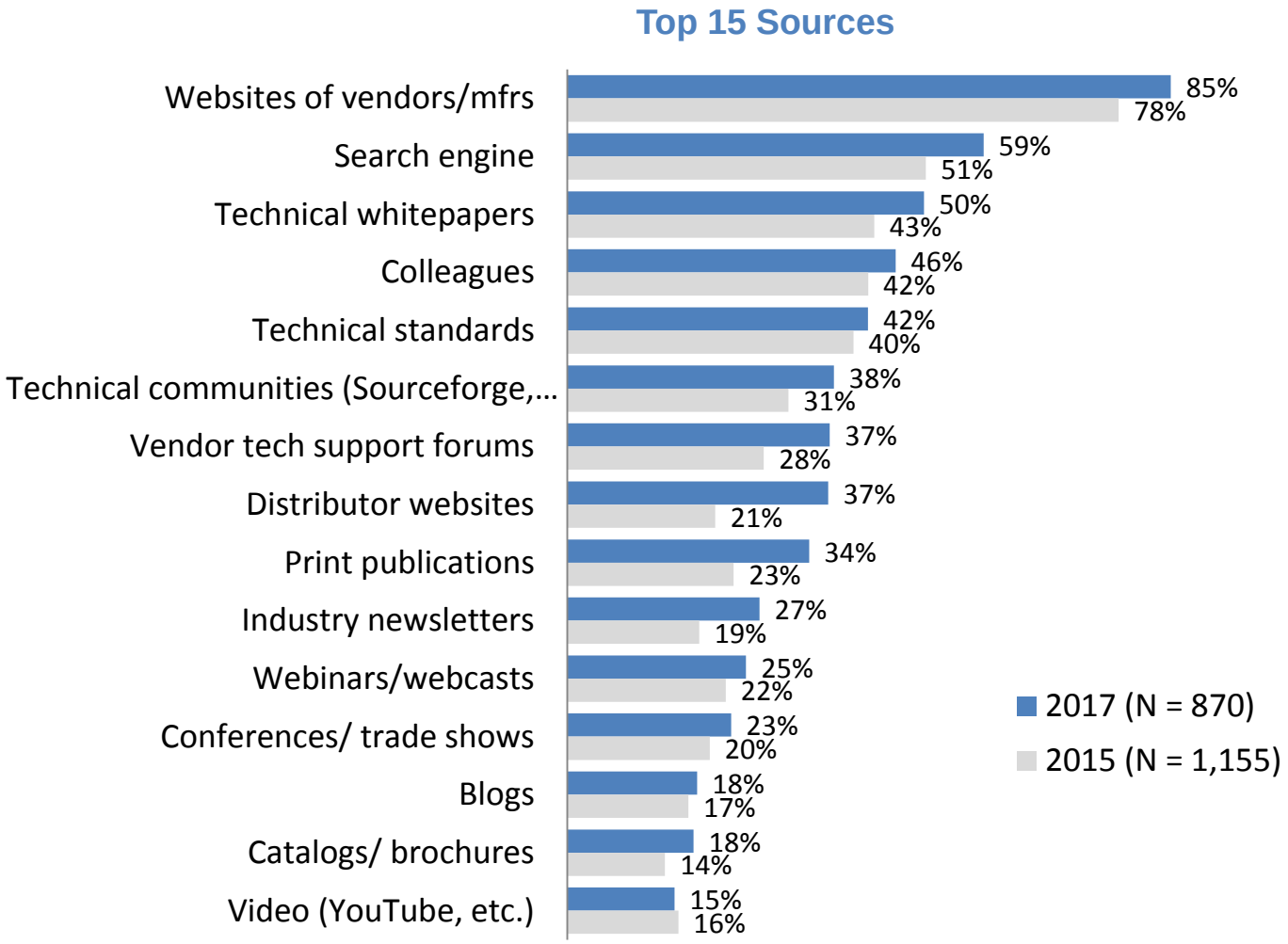
Number of outside partners worked with on average:

- *2.7 vendors in 2017*
- *3.2 vendors in 2015*
- *3.0 vendors in 2014*

If you could improve one thing about your embedded design activities, what would it be?



In general, what sources of information do you consult to research your embedded design decisions?

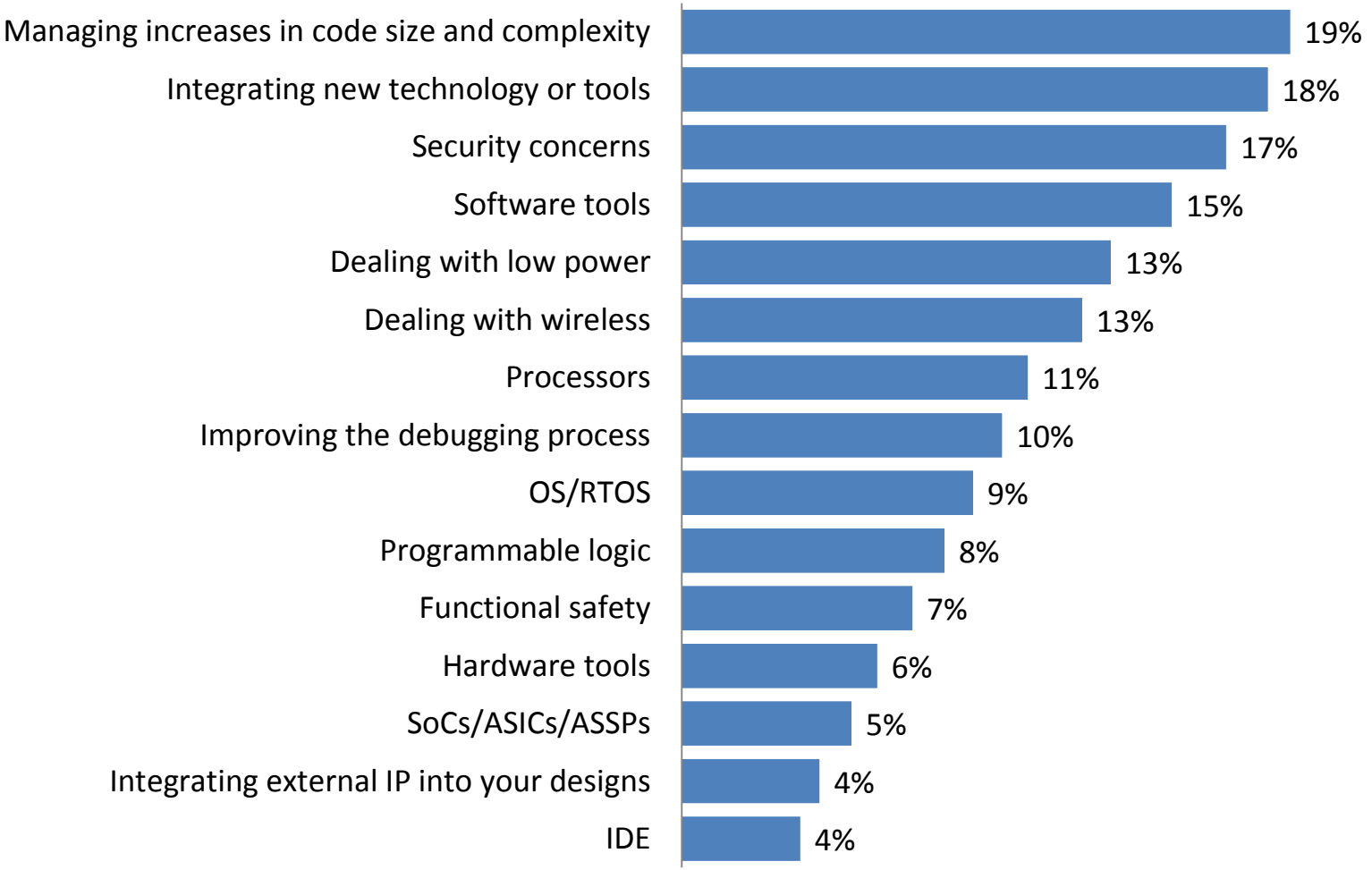


What are your favorite websites related to your professional work? (Write-in responses only)

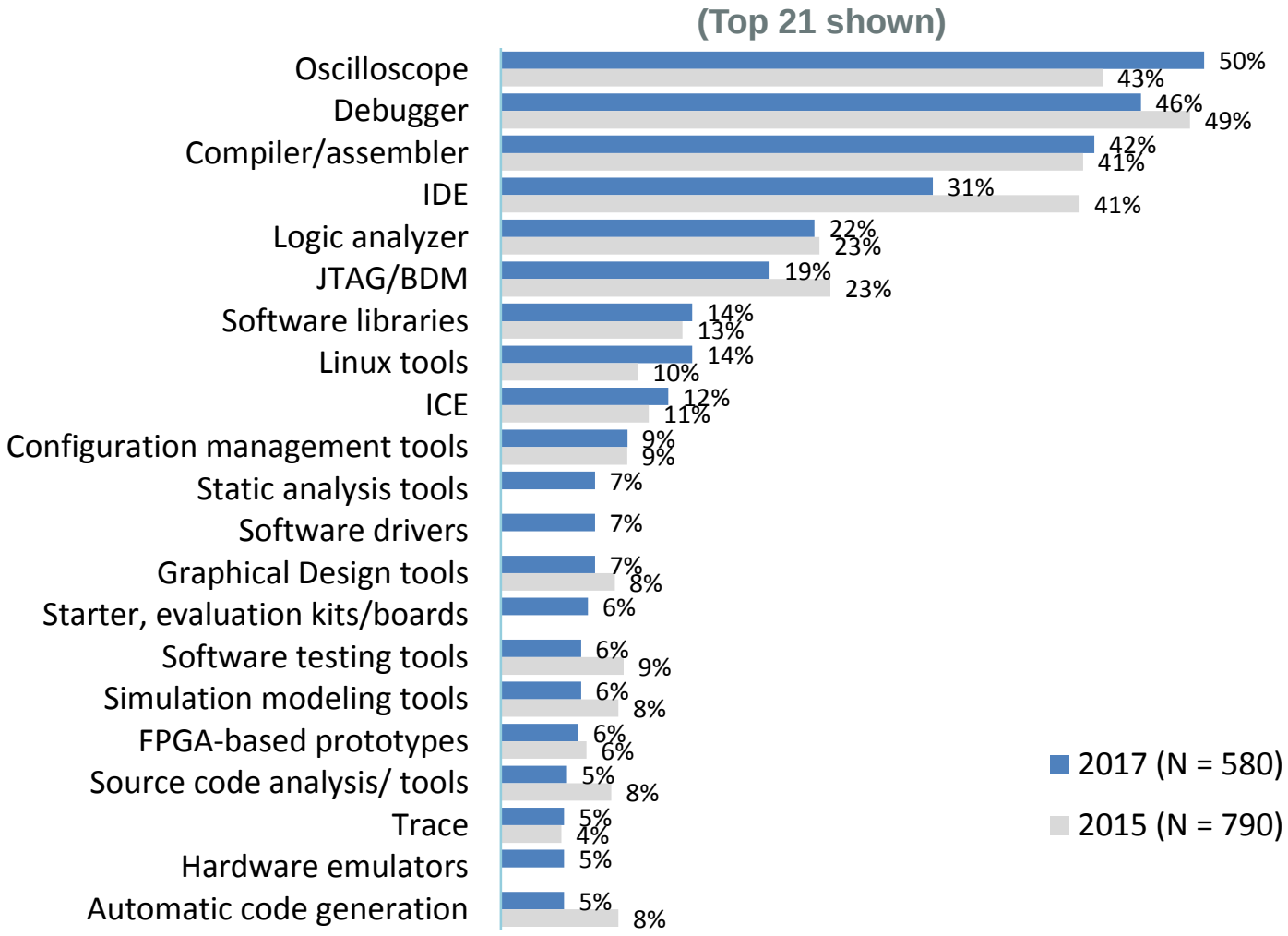
ASPENCORE

Favorite Website (Write-in)	N = 742	Percent
EE Times	102	13.7%
Embedded.com	65	8.8%
Google	61	8.2%
Stack Exchange/Stack Overflow	47	6.3%
EDN	35	4.7%
Digikey.com	30	4.0%
TI	28	3.8%
IEEE	26	3.5%
Linked In	22	3.0%
Wikipedia.com	16	2.2%
Microchip.com	15	2.0%
Altera/Intel/Intel.com	8	1.1%
Nxp.com	7	0.9%
Analog Design/Linear Tech	6	0.8%
Arduin.com	6	0.8%
Electronic Design	6	0.8%
Mouser.com	6	0.8%
Sourceforge	6	0.8%
xilinx.com	6	0.8%
Avrfreaks.com	5	0.7%
National Instruments	5	0.7%
Slashdot.org	5	0.7%
YouTube	5	0.7%
Atmel.com	4	0.5%
Embedded	4	0.5%
Farnell	4	0.5%
Hacker News	4	0.5%
Microsoft.com	4	0.5%
STMicro	4	0.5%

Thinking about the next year, what areas will be your greatest technology challenges?



Which of the following are your favorite/most important software/hardware tools?

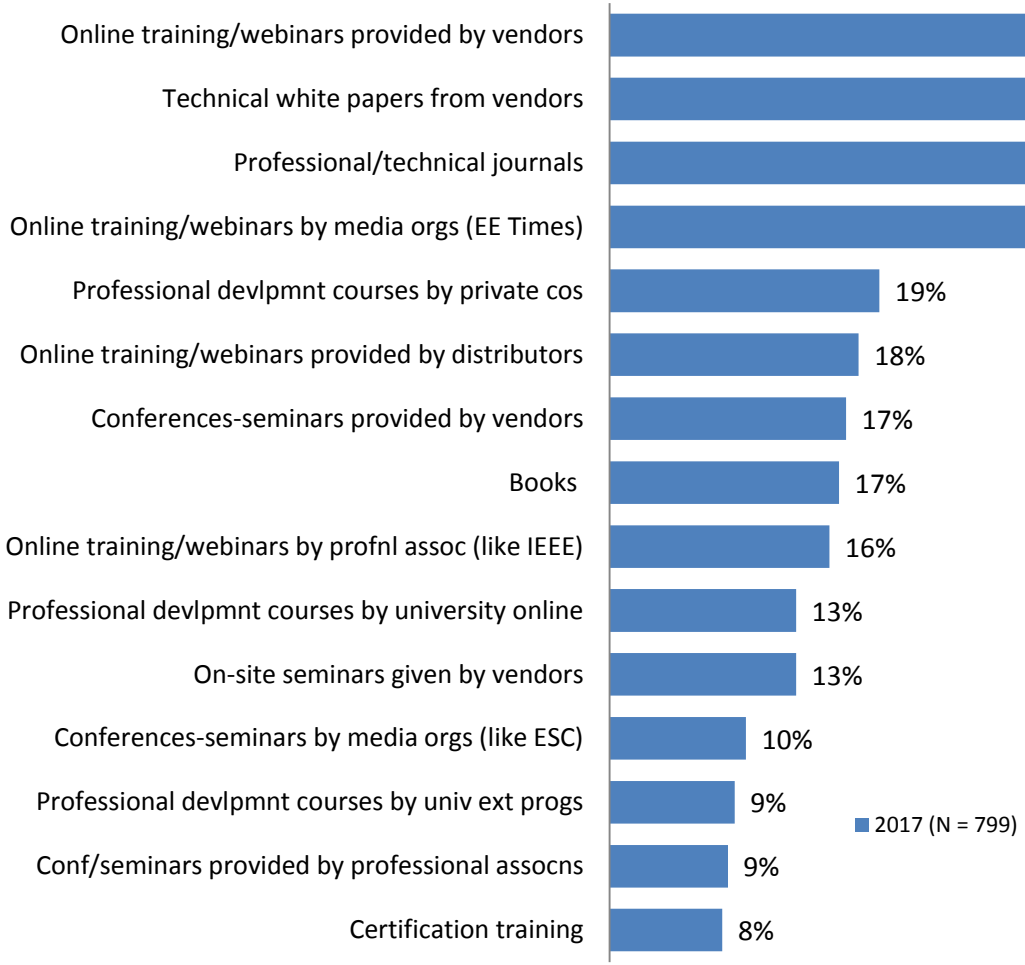


Which of the following conferences have you attended in the last two years, and which do you plan to attend in the next year?

ASPENCORE

Conferences	Have Attended	Plan to Attend	Diff
Training/seminars of distributors	38.0%	33.2%	-4.8
Embedded Systems Conference (USA)	21.8	31.4	9.6
Embedded World (Nuremberg)	15.1	19.1	4.0
Electronica	11.9	14.9	3.0
CES (Las Vegas)	10.4	12.5	2.1
DesignCon	9.7	8.8	-.9
Vendor technical forums/dev conf	9.2	8.8	-.4
Sensors Expo	8.2	13.6	5.4
CeBIT	6.2	6.9	.5
Embedded Linux Conference (ELC)	5.2	8.0	2.8
IEEE Intl Conf on ERTCSA	5.0	9.3	4.3
Embedded Systems Conference (India)	3.2	6.4	3.2
DAC	3.0	2.9	-.1
Mobile World Congress	3.0	5.1	2.1
Android Builders Summit	2.7	4.5	1.8
IIC (China)	1.7	2.4	.7
SAE Convergence	1.5	4.0	2.5
Embedded Systems Expo (Japan)	1.0	3.7	2.7
Embedded Systems Conference (Brazil)	0.7	4.5	3.8
Other	9.4	8.8	-.6
2017	**N=403**	**N=376**	

What are the most effective ways that you systematically or formally maintain, educate, and advance your professional skills?



Other Related Demographics	2017	2015	2014	2013
Average days per year spent on career training	9.7	9.5	9.2	9.0
Average number of years out of school	24.9	20.0	21.6	19.7
Hours per week spent reading technical publications	4.8	4.6	5.2	4.8
Technical books read in full or in substantial part per year	3.2	3.7	3.9	3.9

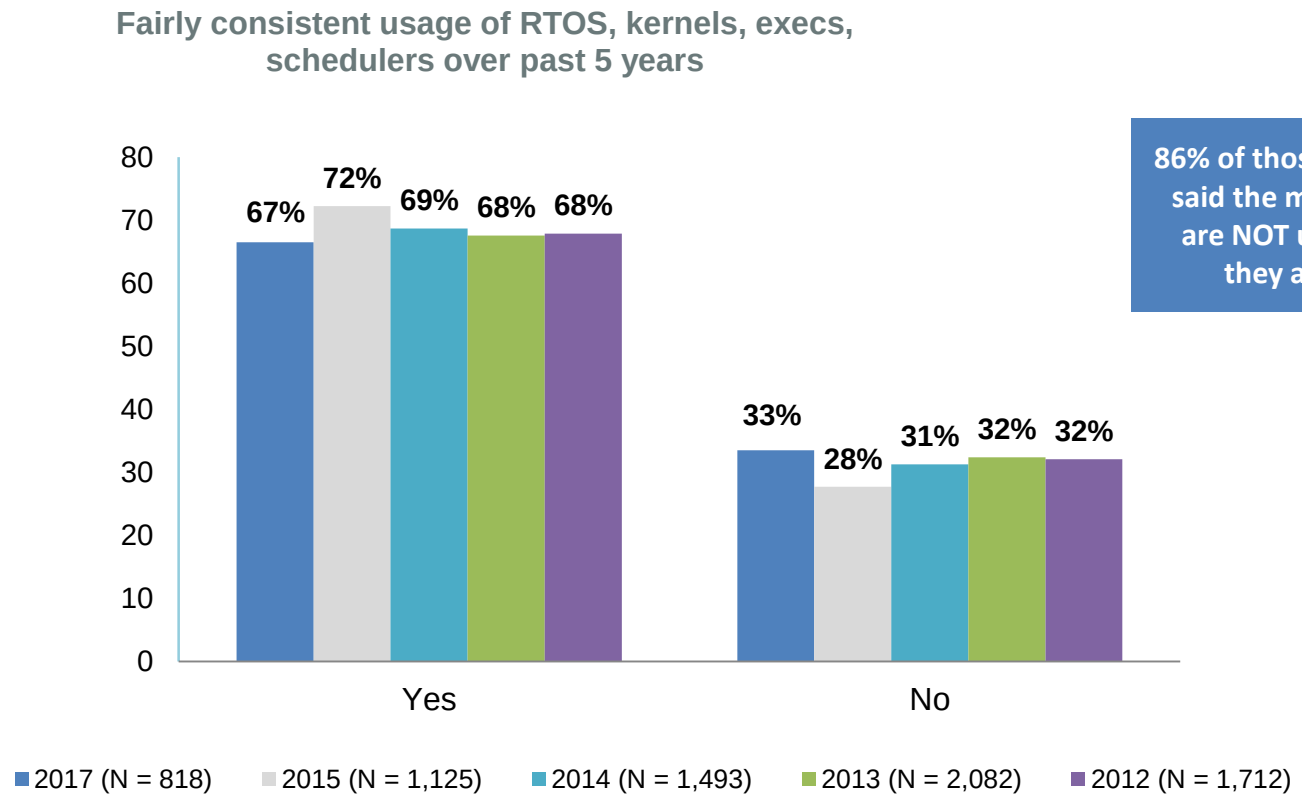
Embedded Design Process Challenges

ASPENCORE

- **Challenges –** Debugging (23%) and meeting schedules(23%).
- **Stages –** Detailed design (32%) & testing/debugging (20%) take most time
- **Vendors –** Work with 2.7 outside vendors on average in 2017 (down from 3.3)
- **Most Need to Improve –** Debugging tools (19%), schedule (17%), engineering team skills (15%)
- **Sources of Info –** Vendor websites (85%) leads all others by far
- **Technical Challenges –** Dealing with code complexity (19%), integrating new technology (18%) and security (17%) are top priorities.
- **Favorite Tools – O**scilloscope (50%), debugger (46%), compiler (42%) and IDE (31%)
- **Maintaining professional skills – O**nline training courses (43%); technical white papers (38%), reading professional technical journals (37%); webinars by media orgs (31%) are at the top of the list.
- **Other Skill Enhancers:** 9.7 days/year career training; 24.9 years of career experience; 4.8 hours per week reading technical publications; read 3.2 books per year.

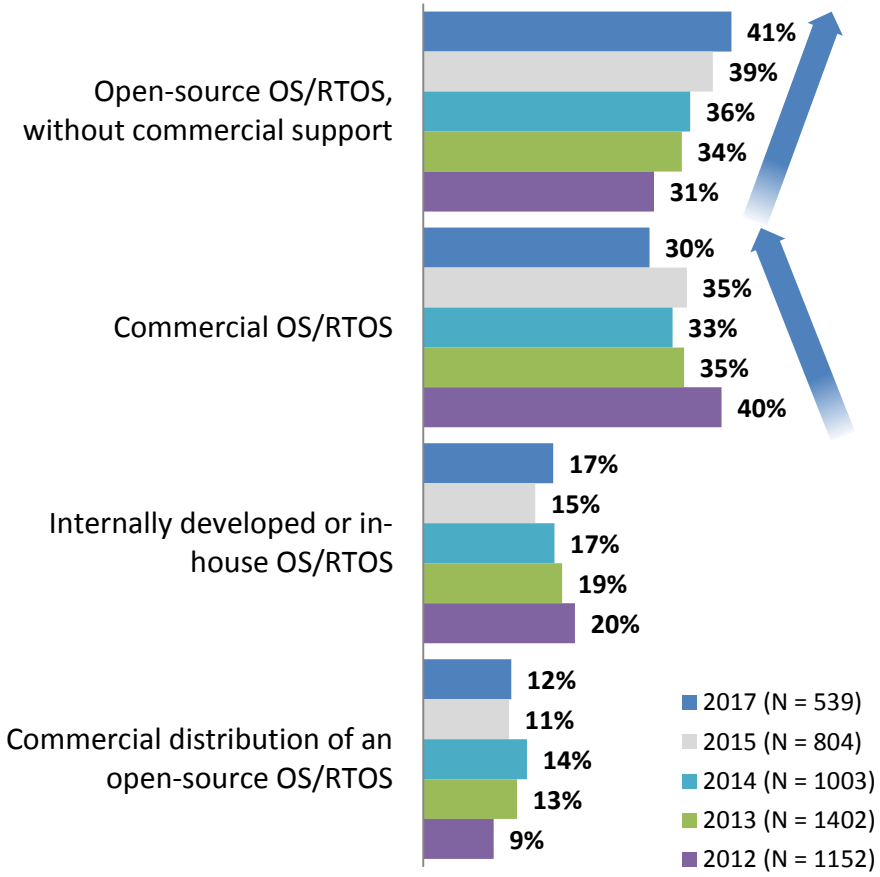
OPERATING SYSTEMS

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

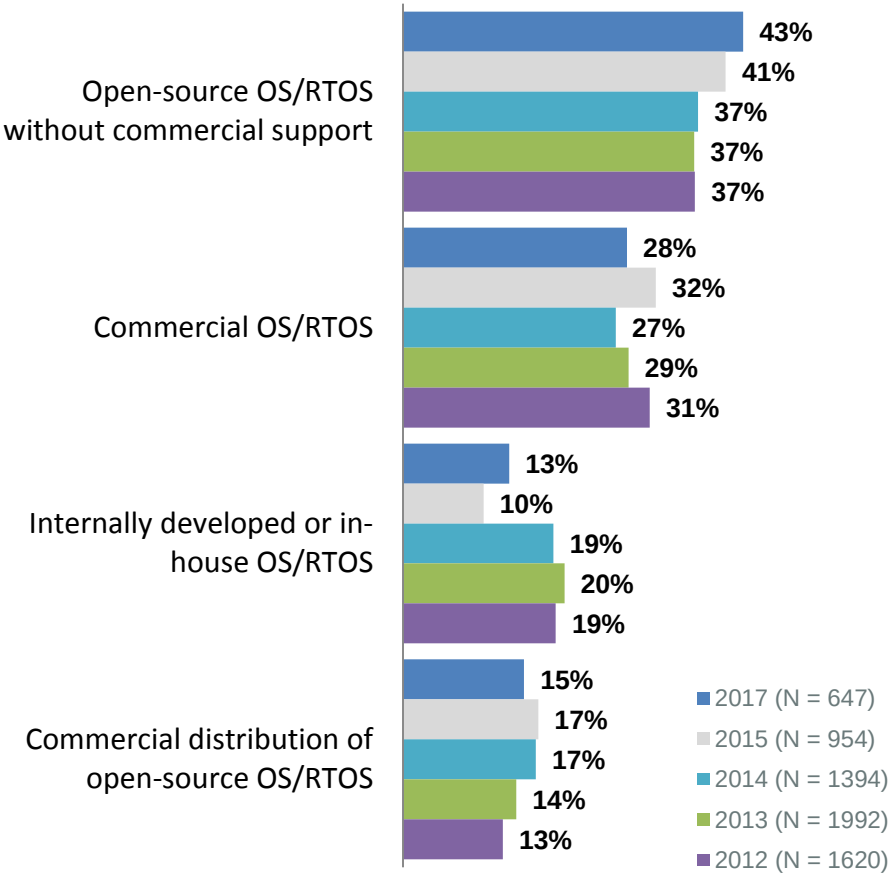


86% of those not using RTOSes, said the main reason RTOSes are NOT used is simply that they are not needed.

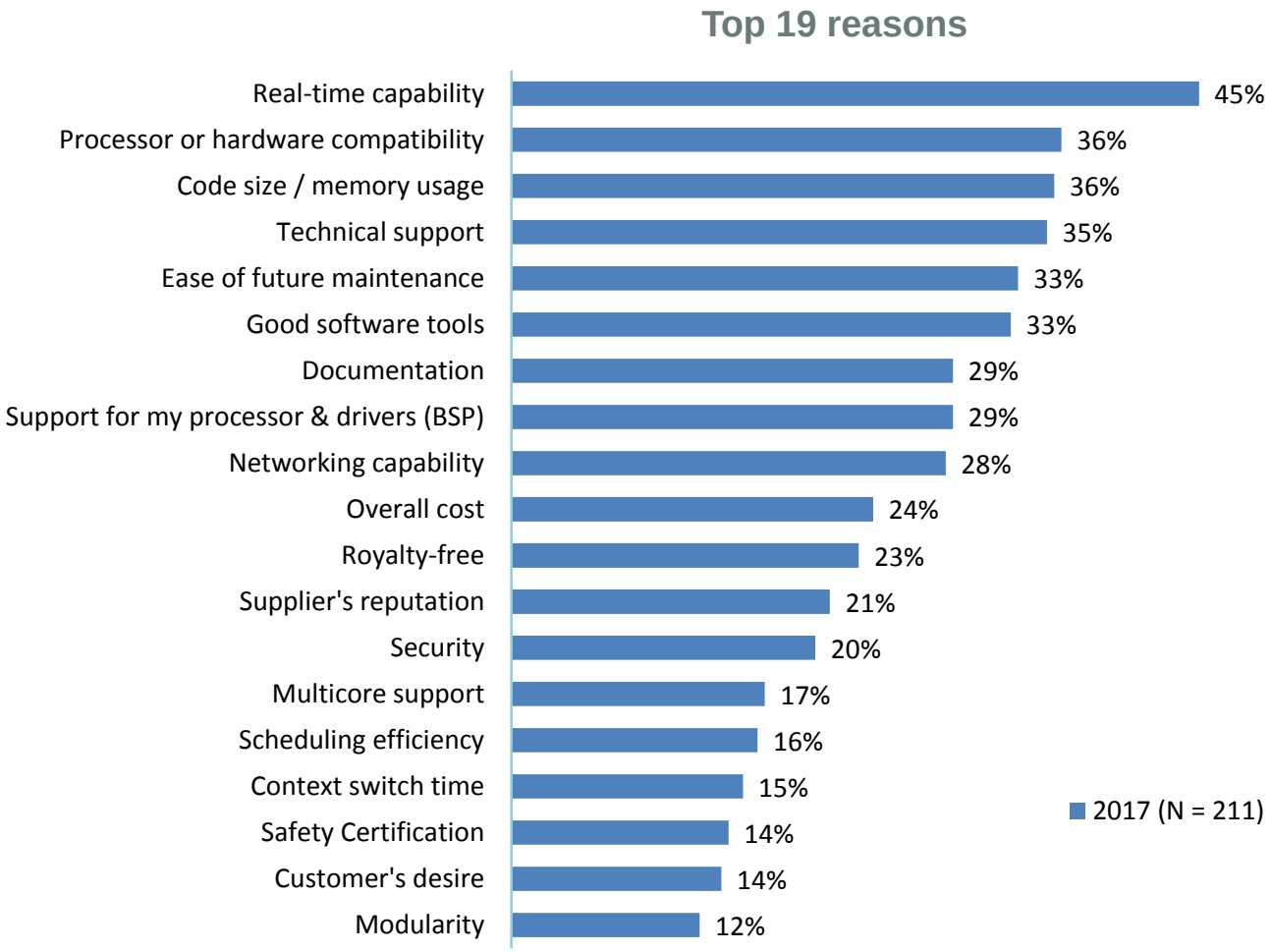
My current embedded project uses:



My next embedded project will likely use:

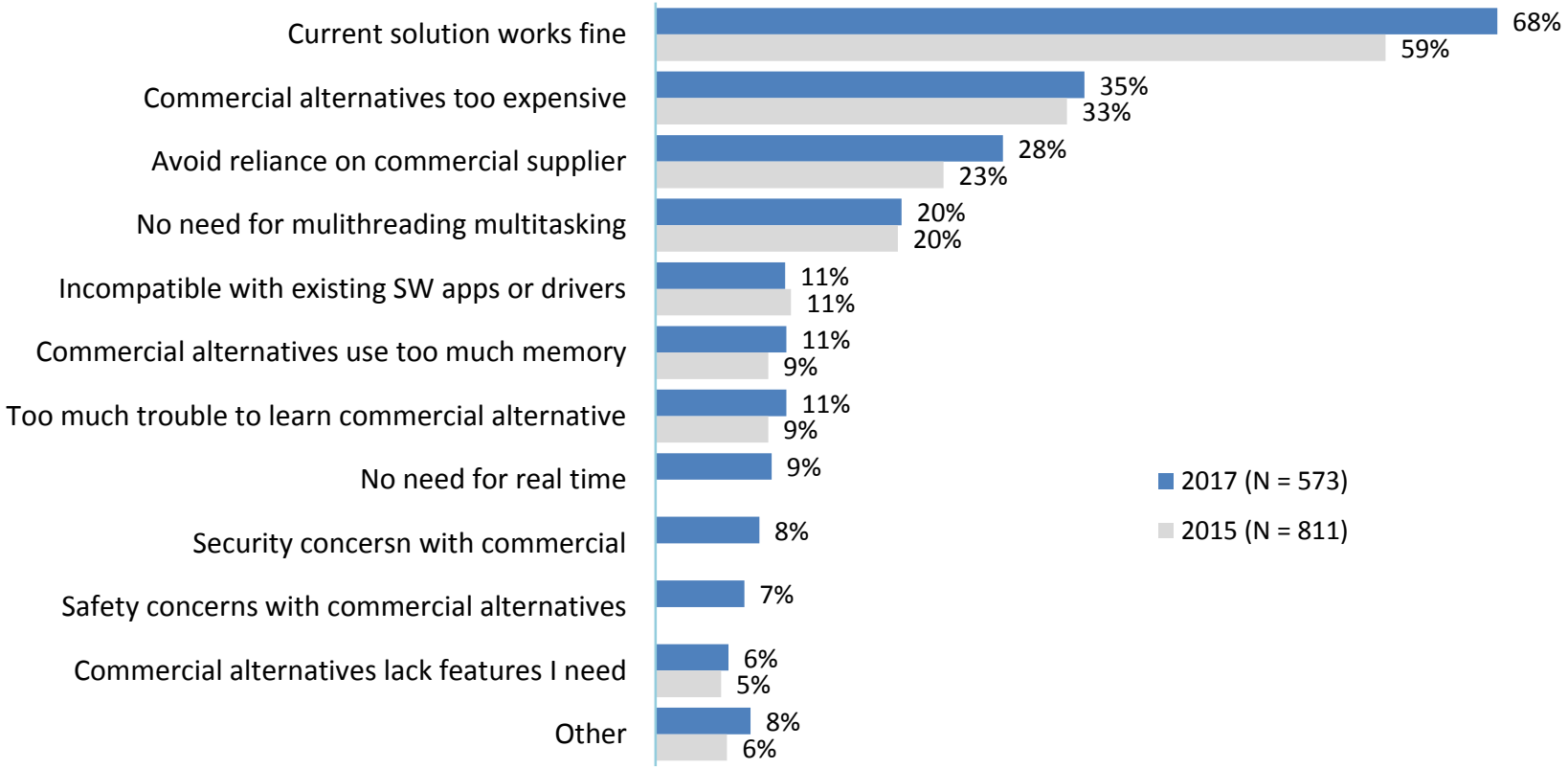


Which factors most influenced your decision to use a commercial operating system?



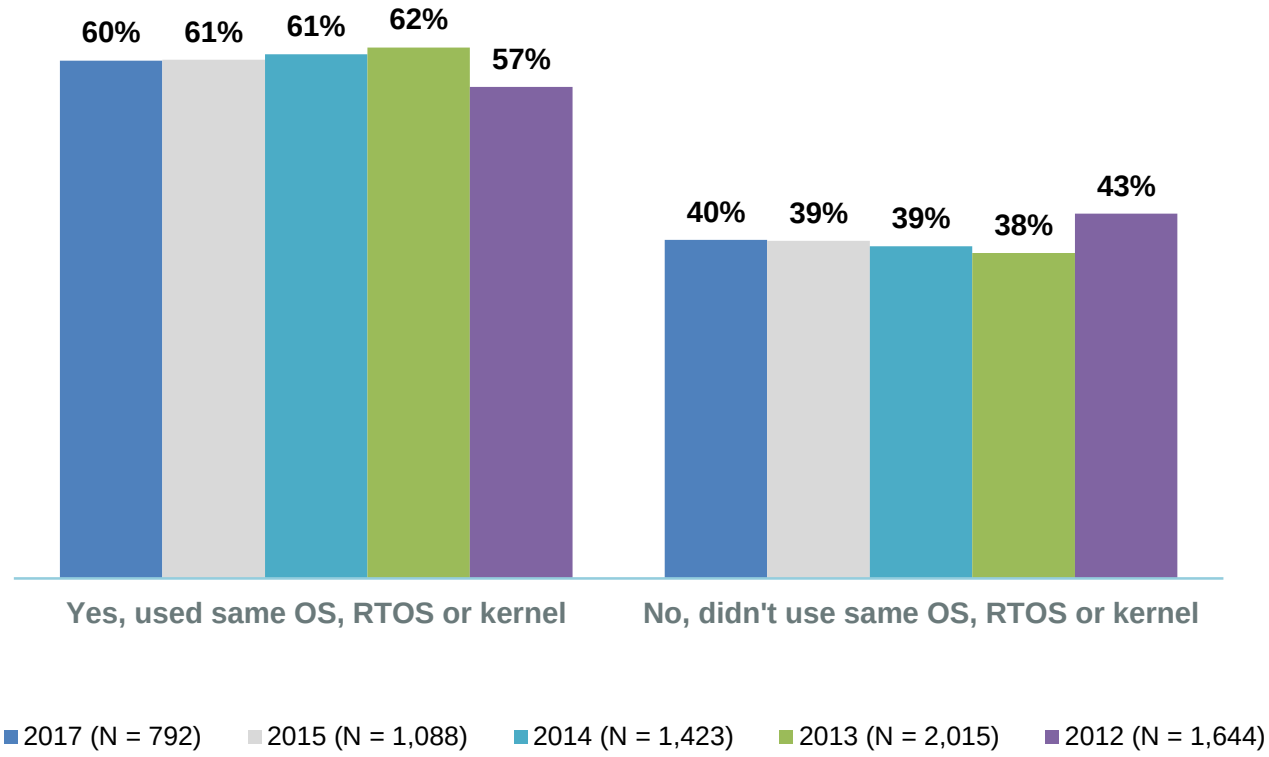
Base = Those who currently use a "Commercial" OS/RTOS

What are your reasons for not using a commercial operating system?



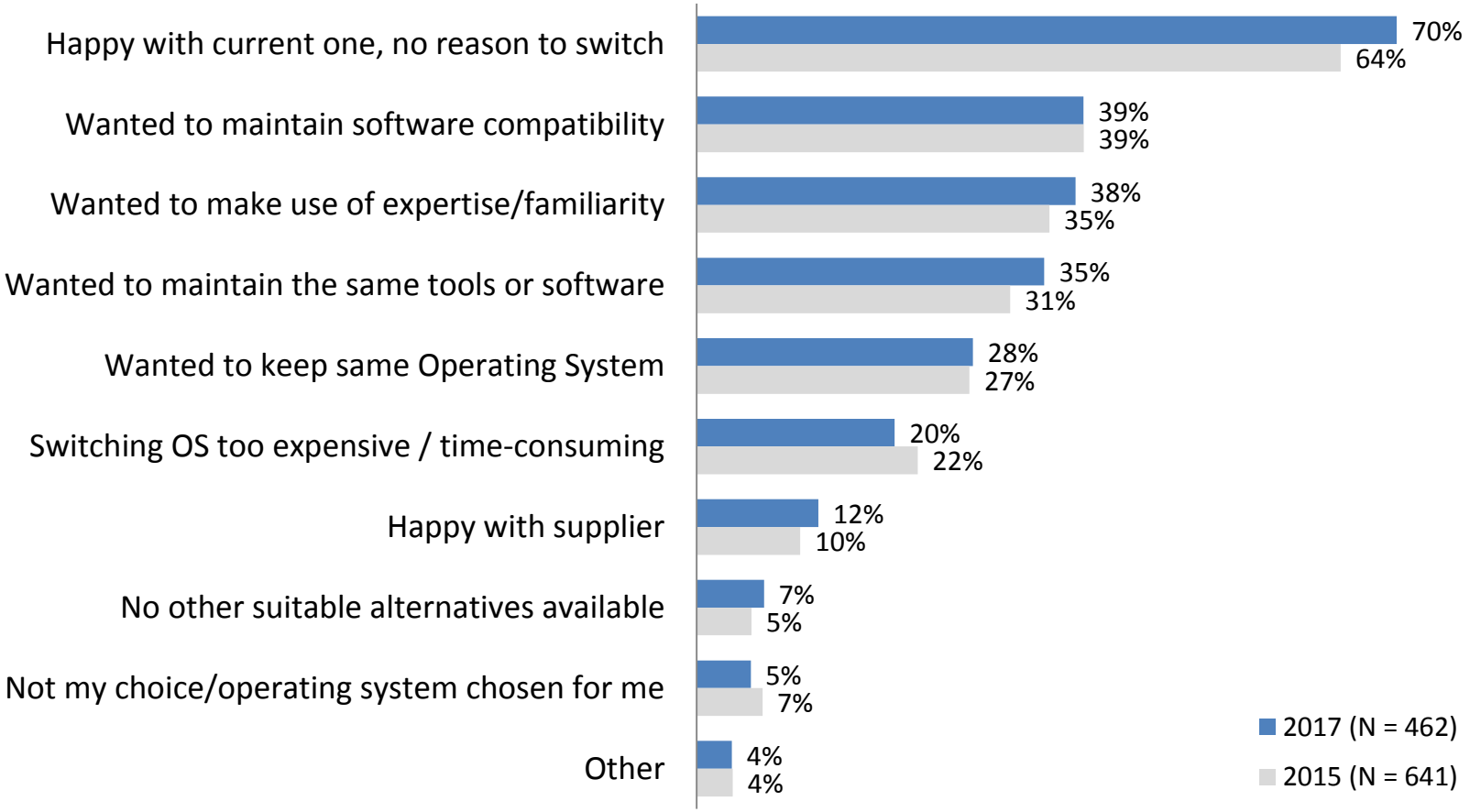
Base = Those who do not currently use a "Commercial" OS/RTOS

Did you use the same operating system, RTOS, or kernel as in your previous project?



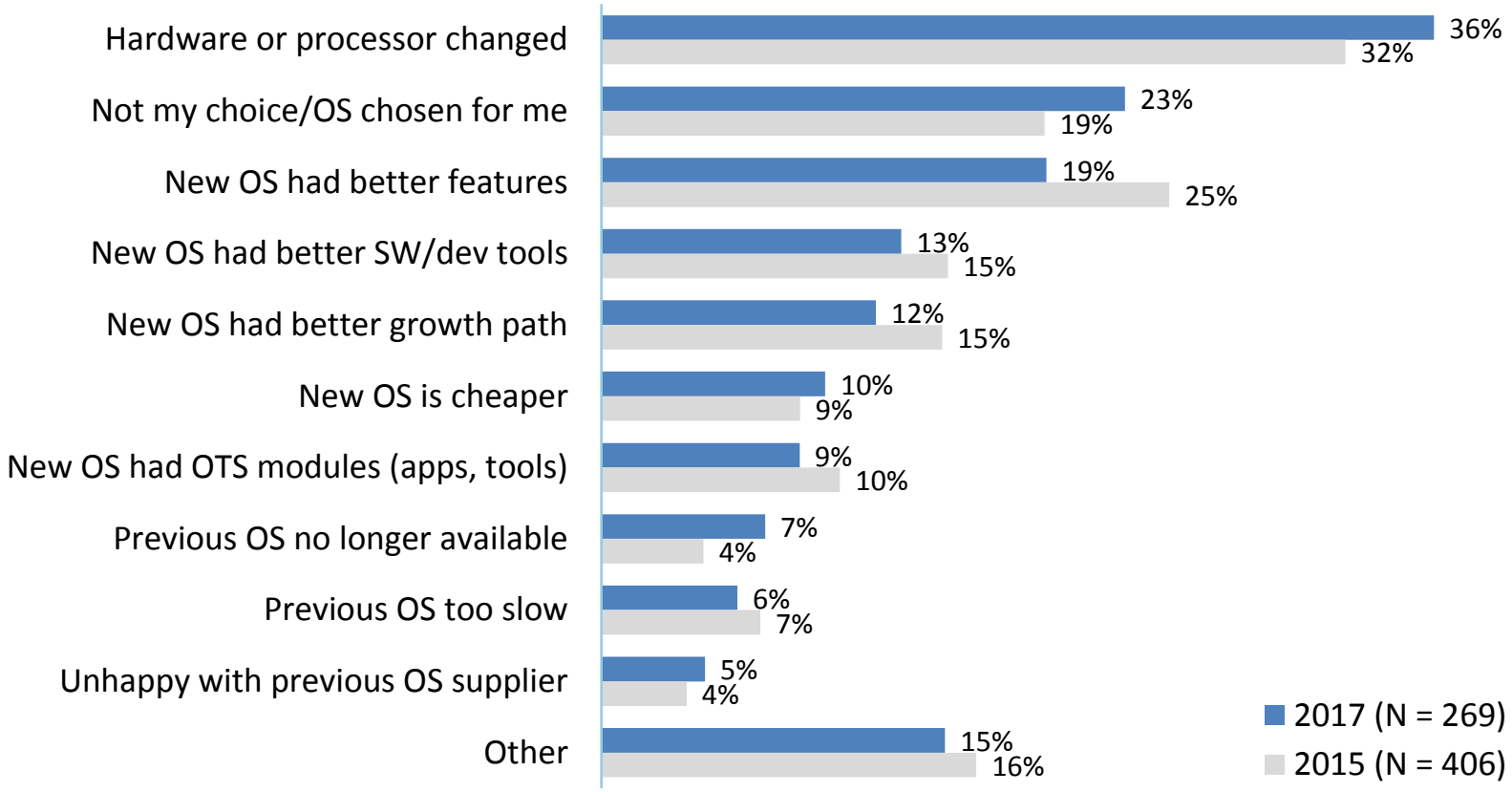
Base: Those who use operating systems

Why did you use the same operating system?

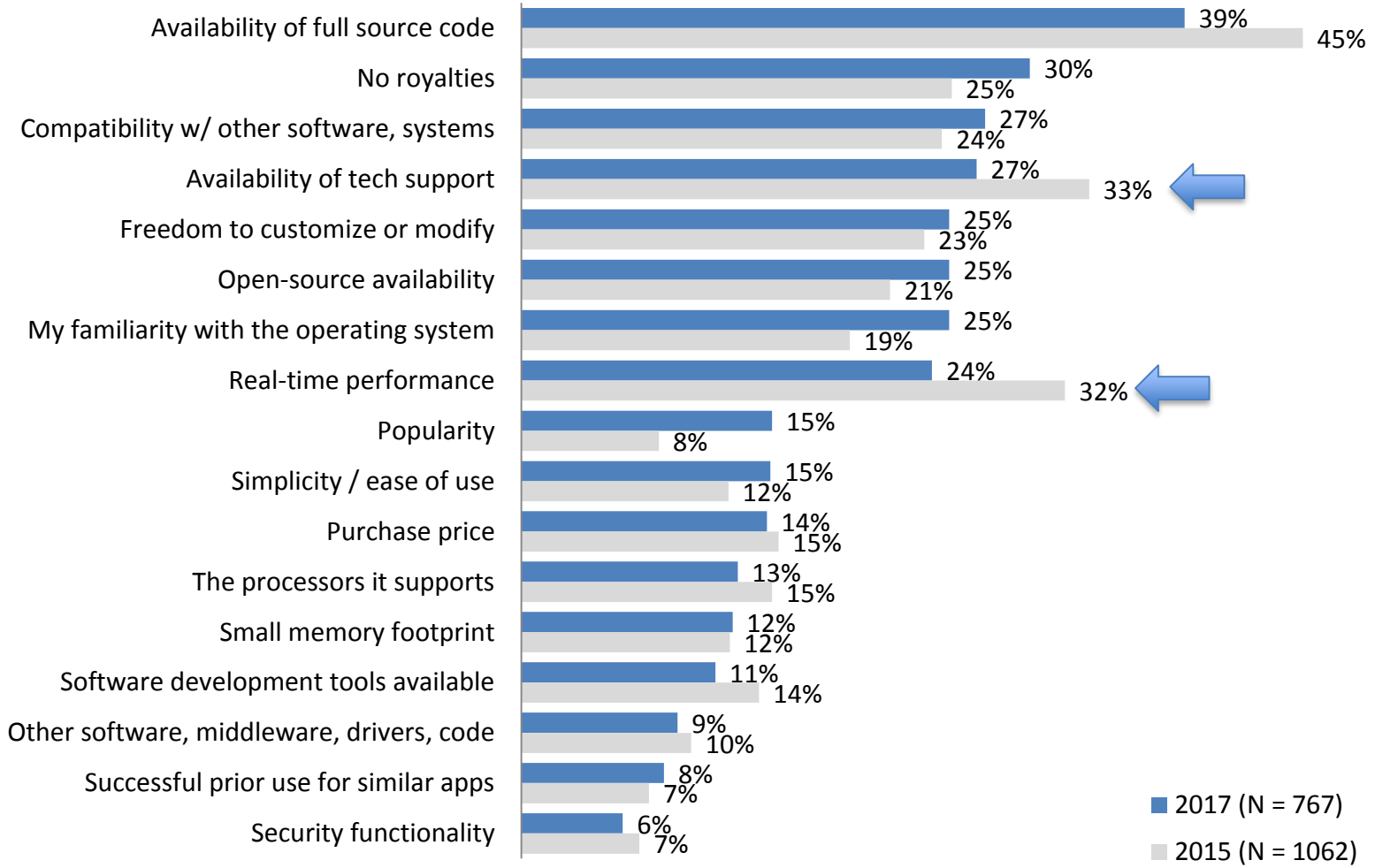


Base = Those who are using the same operating system as in previous project

Why did you switch operating systems?

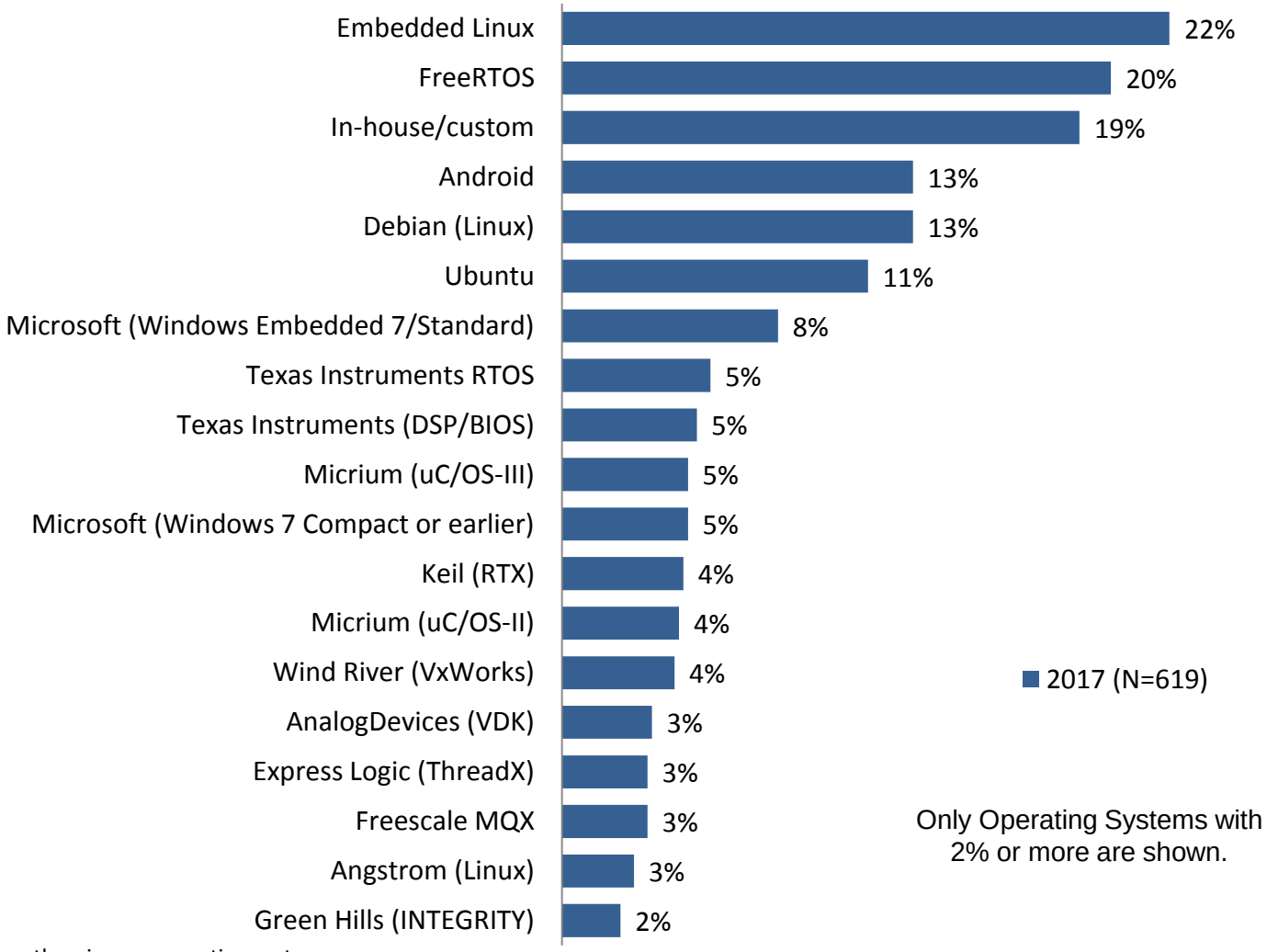


What are the most important factors in choosing an operating system?



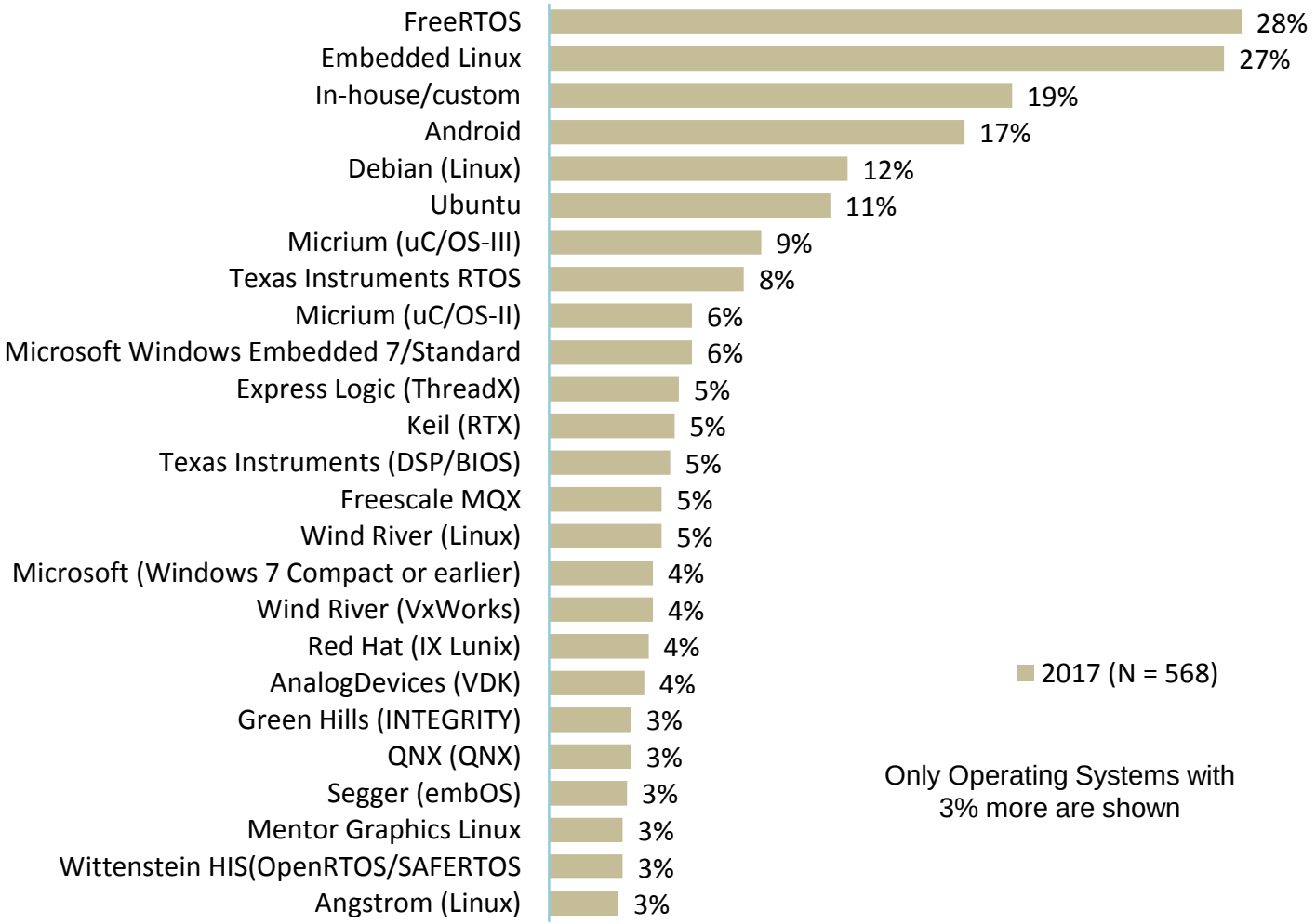
Base: Currently using an operating system

Please select ALL of the operating systems you are currently using.



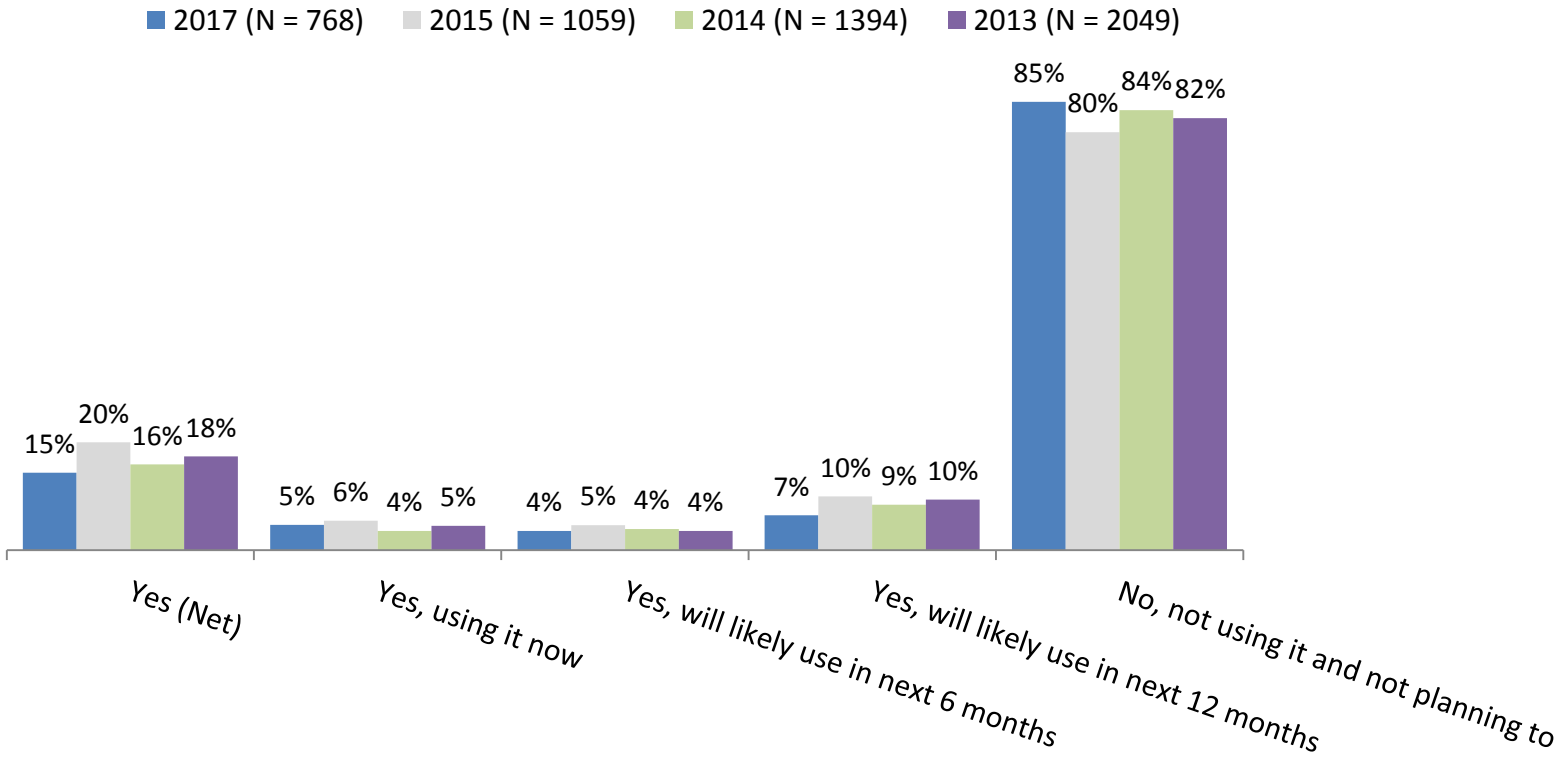
Base: Currently using an operating system

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



Base: Those who are considering an operating system in any project in the next 12 months

Are you currently using embedded virtualization/hypervisors or will you likely use this in the next 12 months?



Top reasons for using virtualization/hypervisors

Separation of multiple applications	49%
Need to support hard real-time applications and guest OS	37%
Need to support multiple guest OSes (e.g., Android, VxWorks, Linux)	31%

Operating Systems

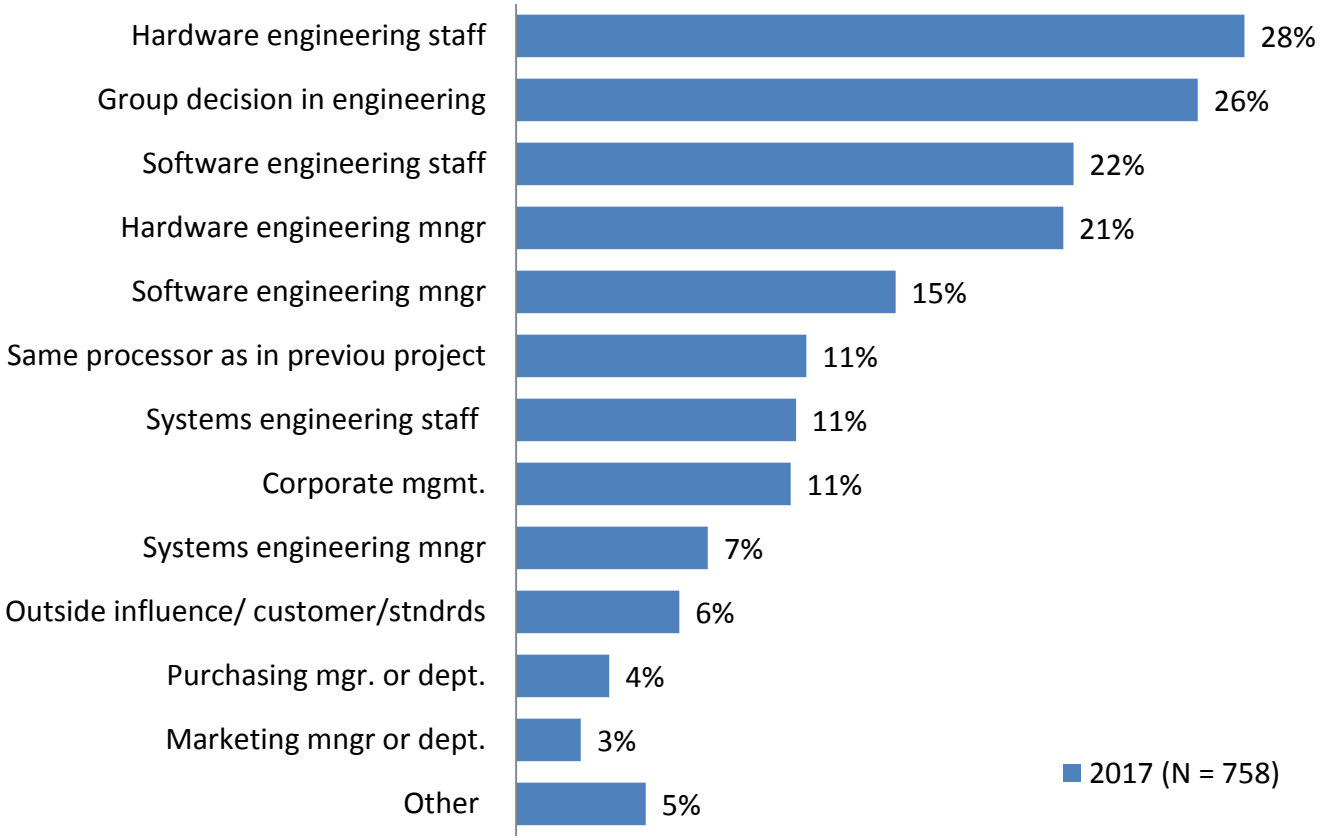
ASPENCORE

- **OS/RTOS usage –** 67% overall usage, down from 2015 (72%).
- **Open Source OS usage –** Now 41%, up from 31% in 2012 and continuing up.
- **Commercial OS usage –** Now 30%, down from 40% in 2012.
- **Used same OS –** 60% used the same OS, down one tick from 2015 of 61%. Happy with it, compatibility, familiarity, same tools are main reasons for using.
- **Reason for Switching –** Hardware/processor changed, chosen for me, new one had better features.
- **Reason for choosing OS –** Full source code (39%), no royalties (30%), compatibility (27%) and tech support (27%).
- **OS/RTOS used –** Embedded Linux (22%), FreeRTOS (20%), Inhouse (19%),
- **OS/RTOS considering –** FreeRTOS (28%), Embedded Linux (27%) and Inhouse (29%) were top three RTOSes being considered.
- **Embedded virtualization/hypervisor usage –** Down from 20% in 2015 to 15%.

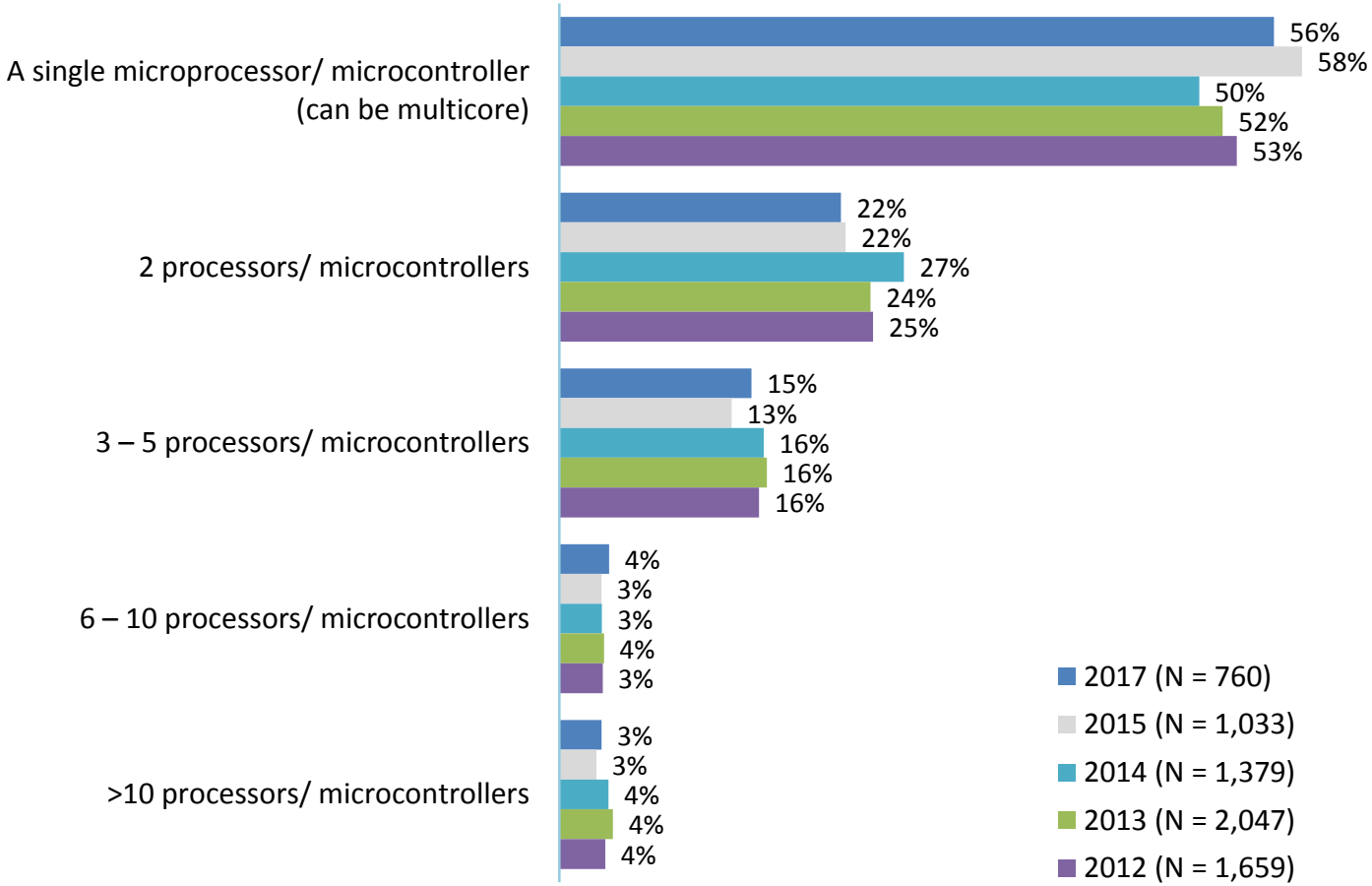
ASPENCORE

MICROPROCESSORS

Who were the greatest influences on the choice of the processor for your current project?



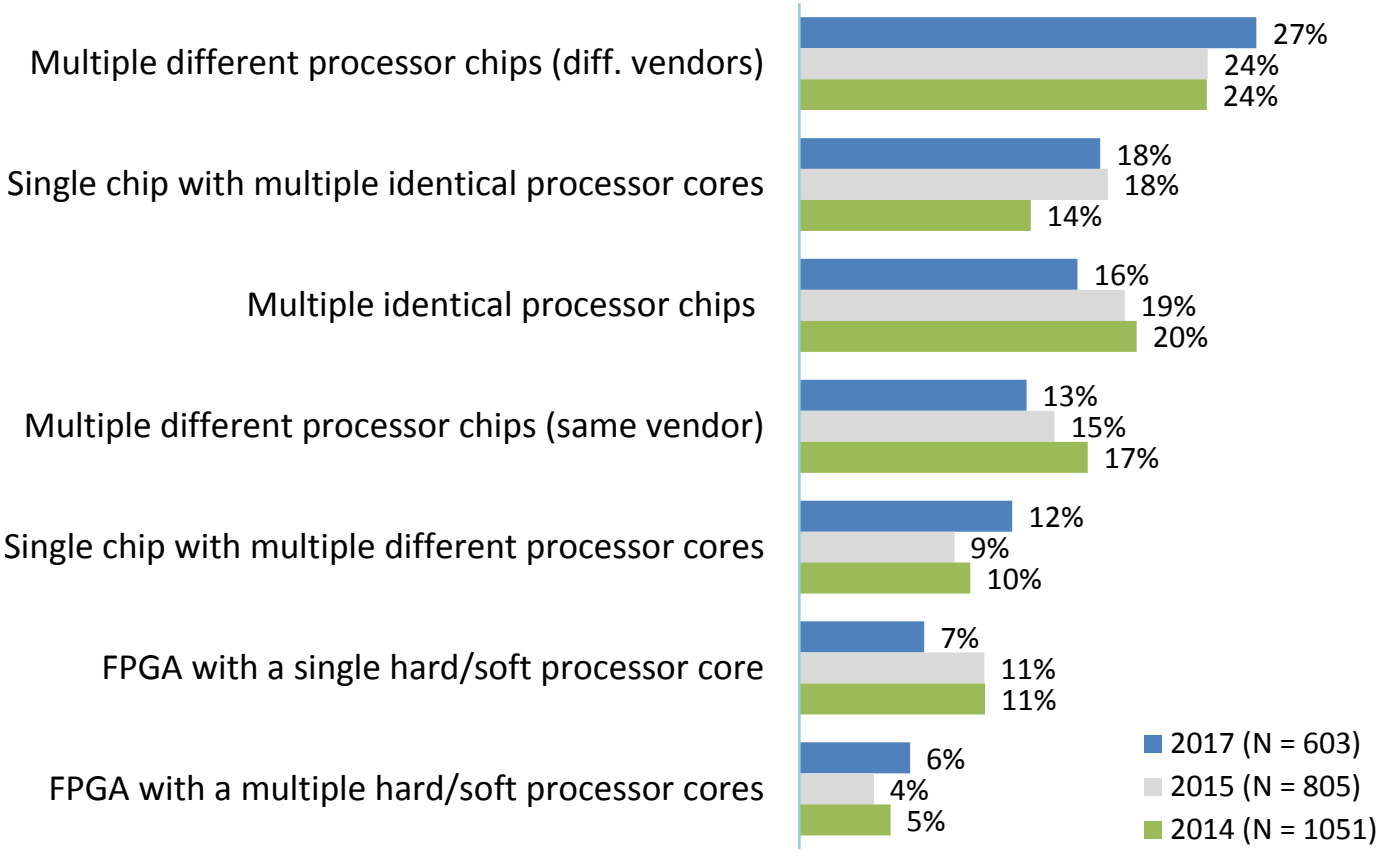
My current embedded project contains:



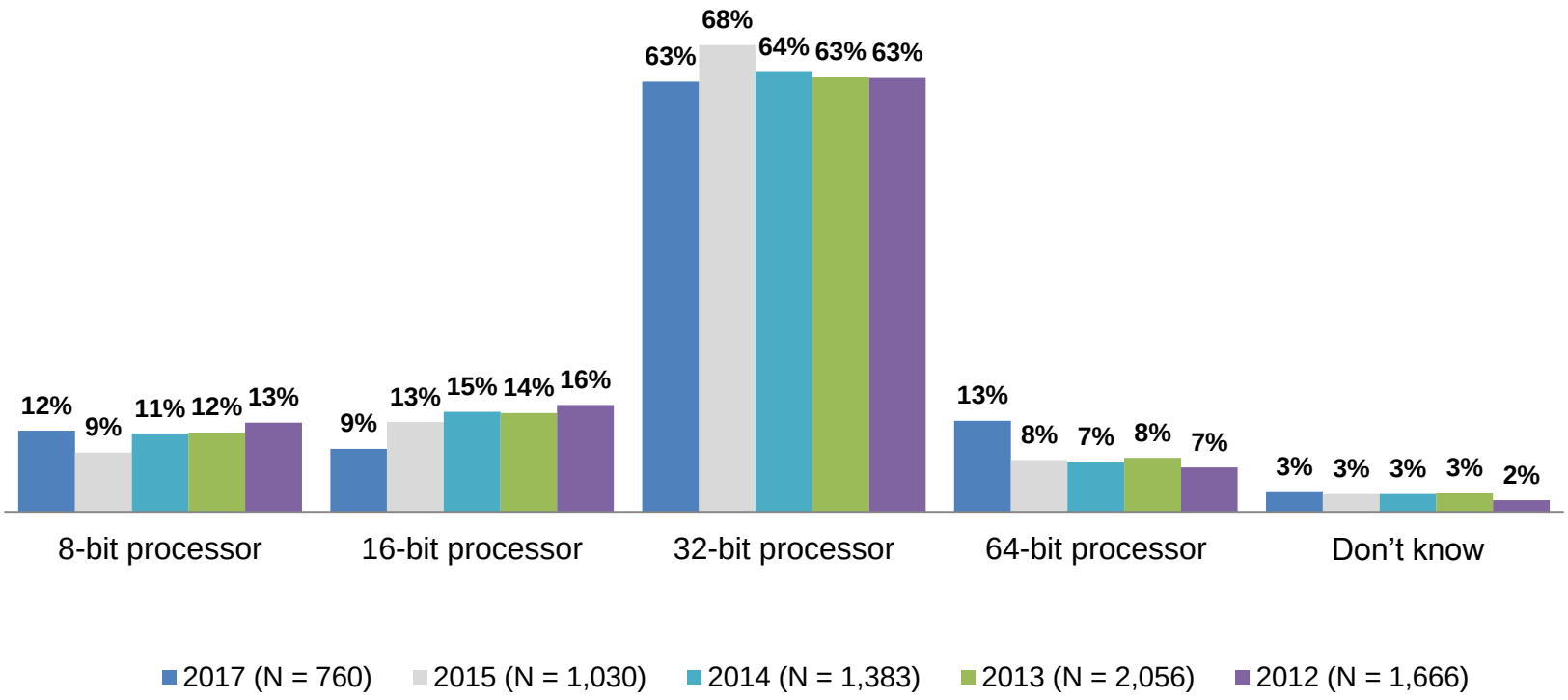
The average number microprocessor/micro controllers per project was:

2.3 in 2017
2.1 in 2015
2.4 in 2014
2.4 in 2013
2.3 in 2012

Does your embedded project contain…

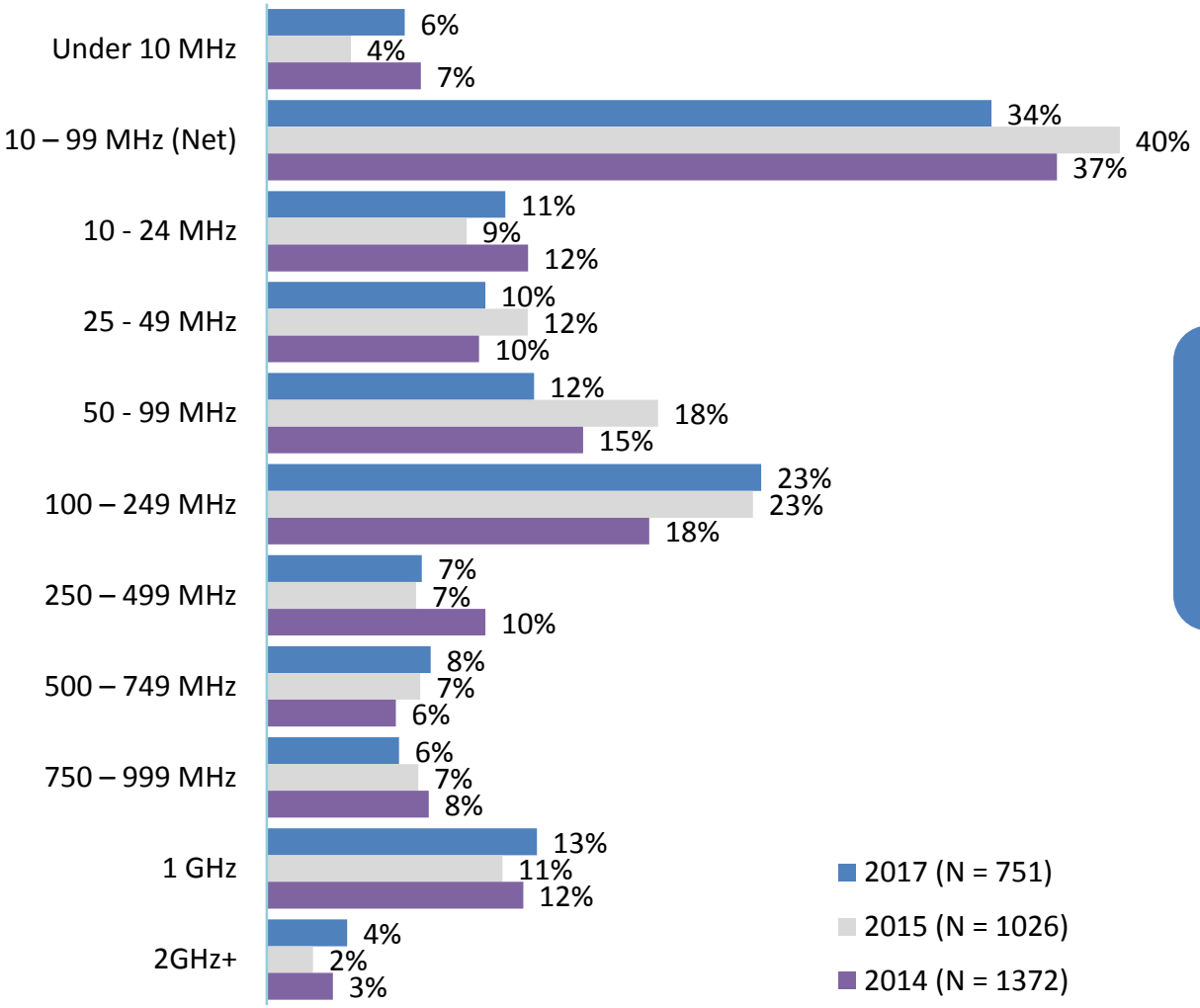


My current embedded project's main processor is a:



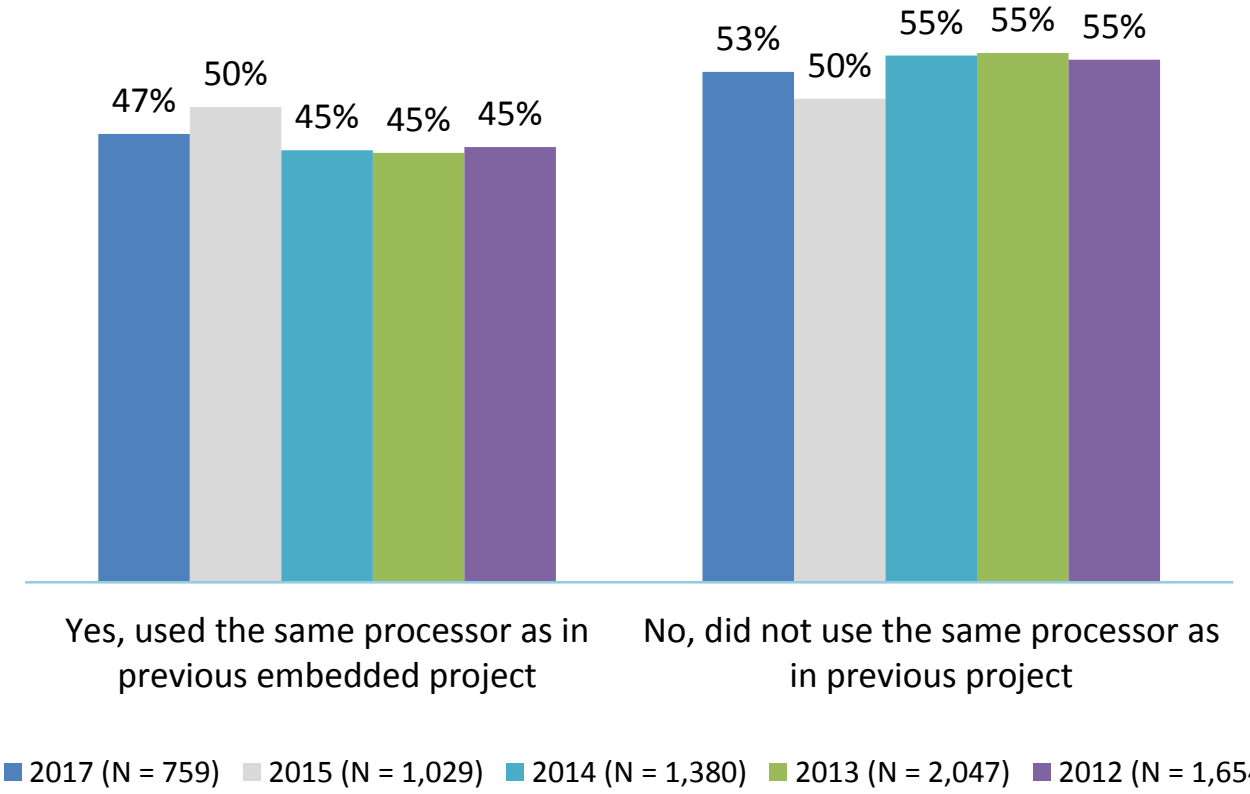
Note. 52% of respondents said additional processors (if any) were 32-bit processors, 18% said they added 8-bit processors, 14% added 16-bit processors, and 11% added 64-bit processors to their current embedded project.

My current embedded project's main processor clock rate is:

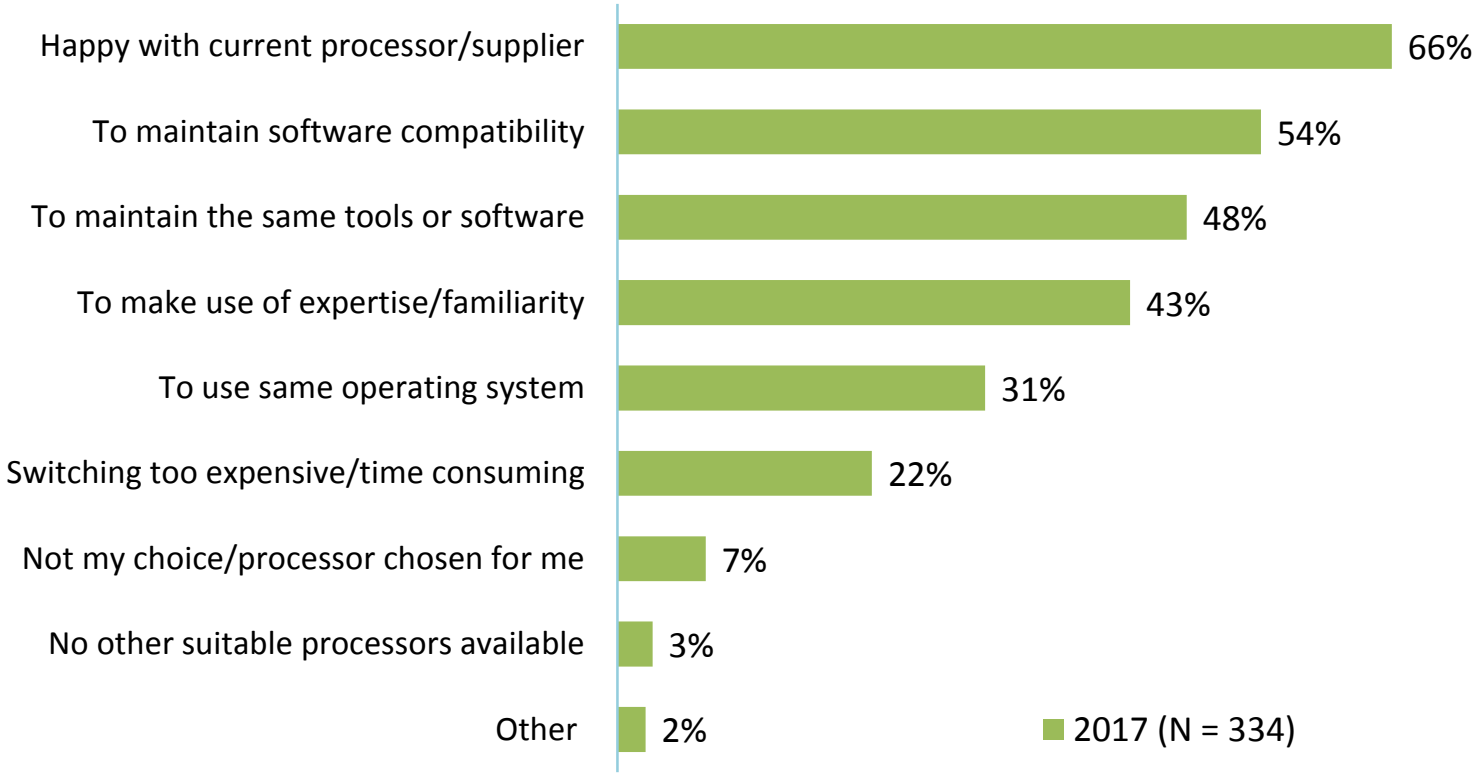


The <u>average</u> processor clock rate was:
445 MHz in 2017
397 MHz in 2015
428 MHz in 2014
485 MHz in 2013

Did you use the same processor as in your previous embedded project?

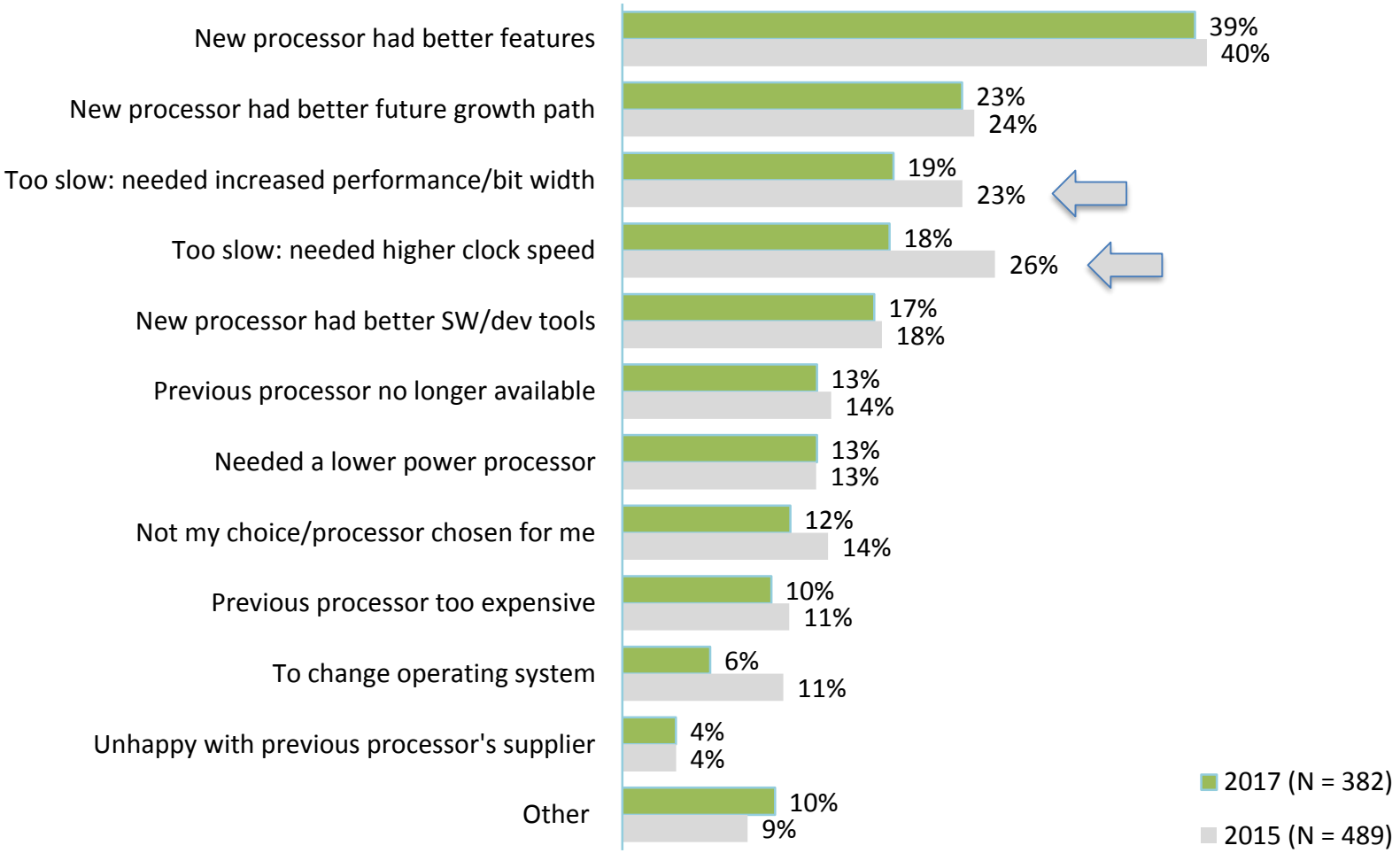


Why did you use the same processor?



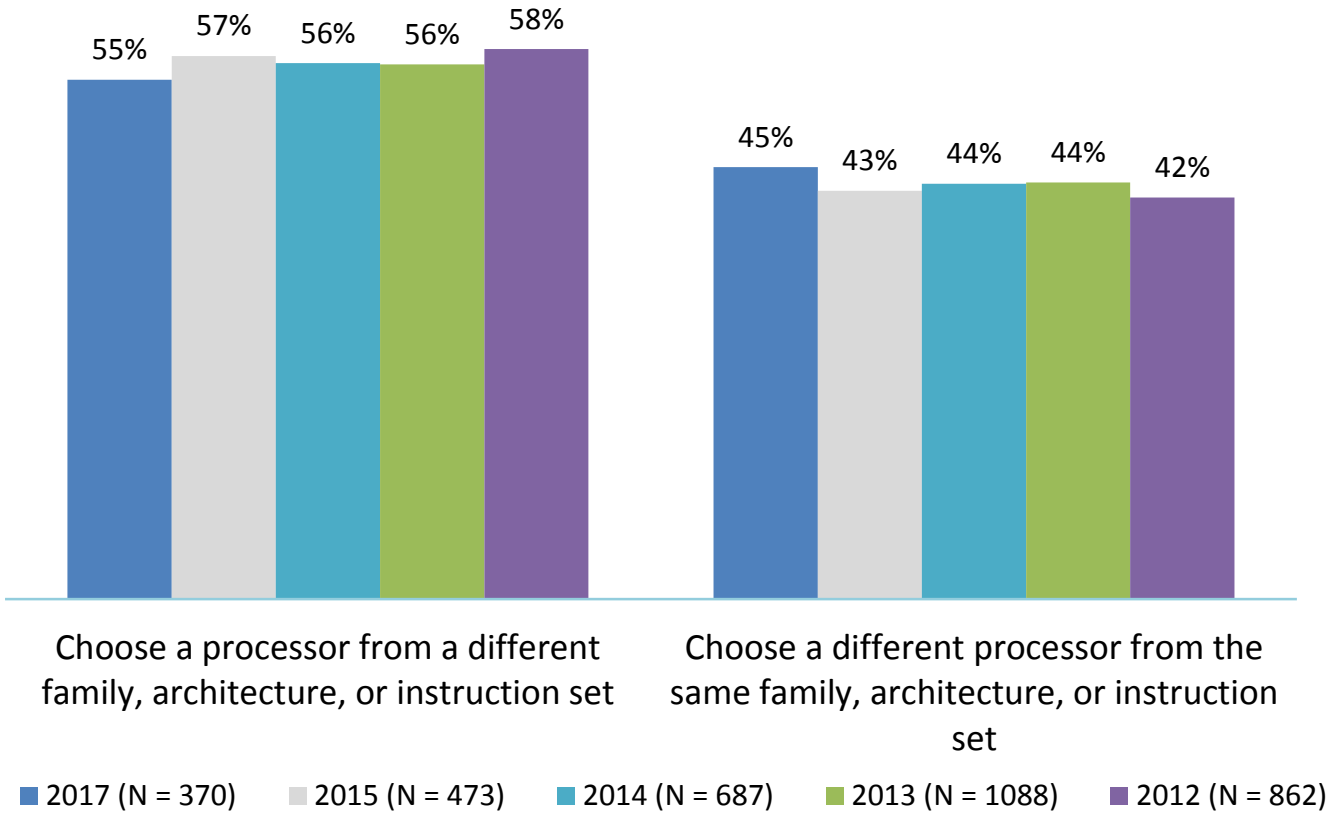
Base = Those who used the same processor as in previous project

What were your reasons for switching processors?



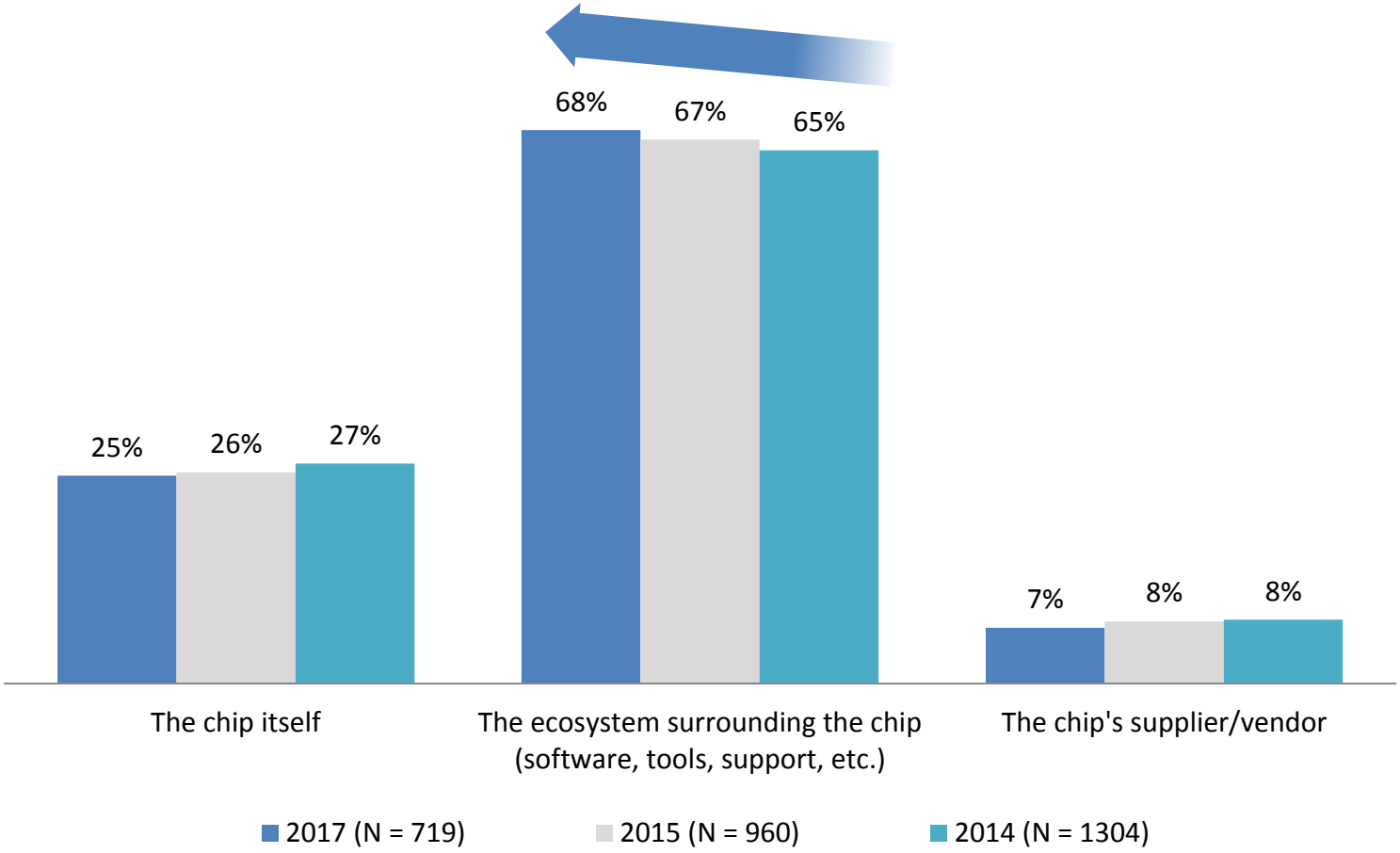
Base = Those who did not use the same processor as in previous project

Did you…

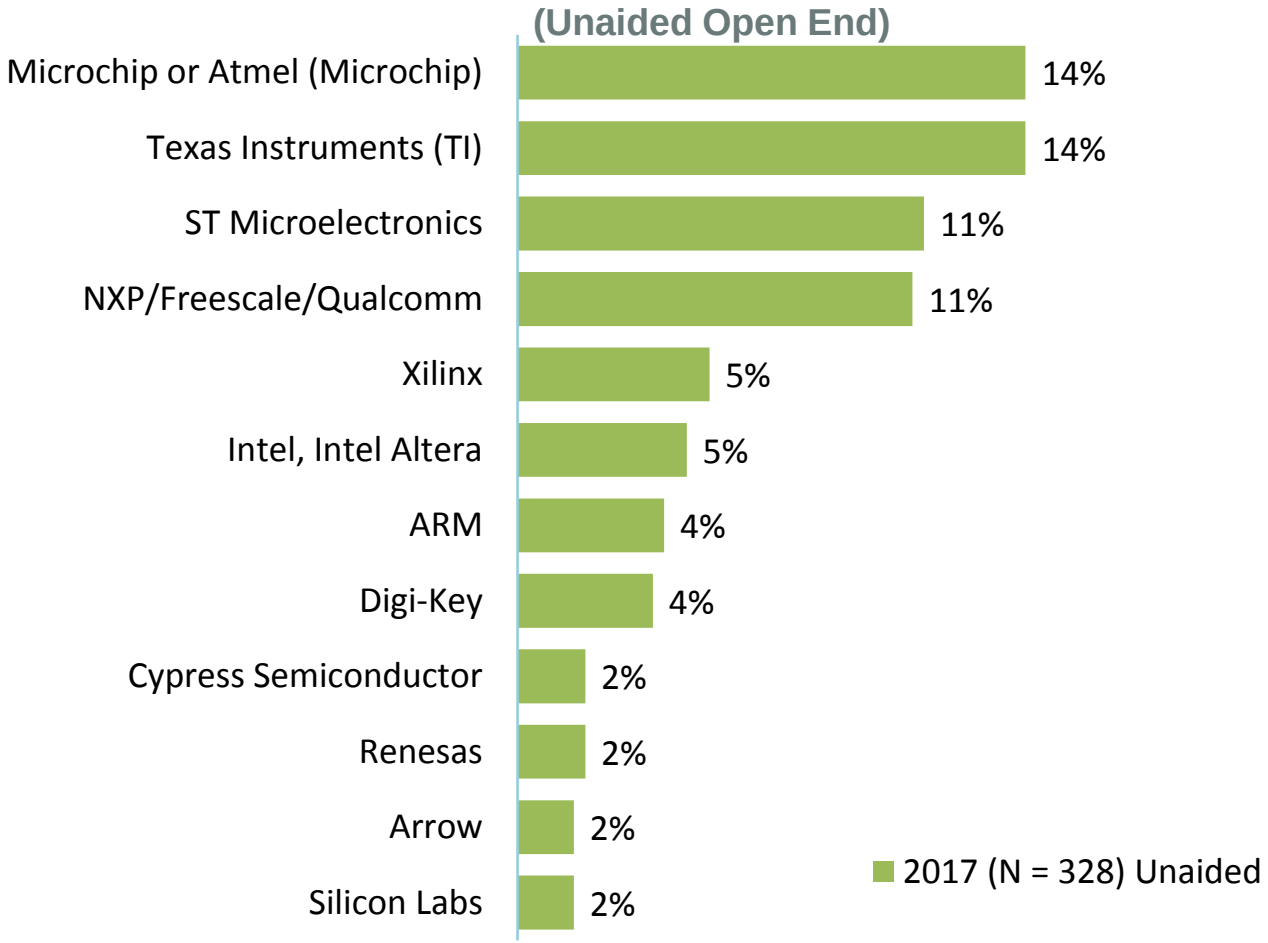


Base = Those who did not use the same processor as in previous project

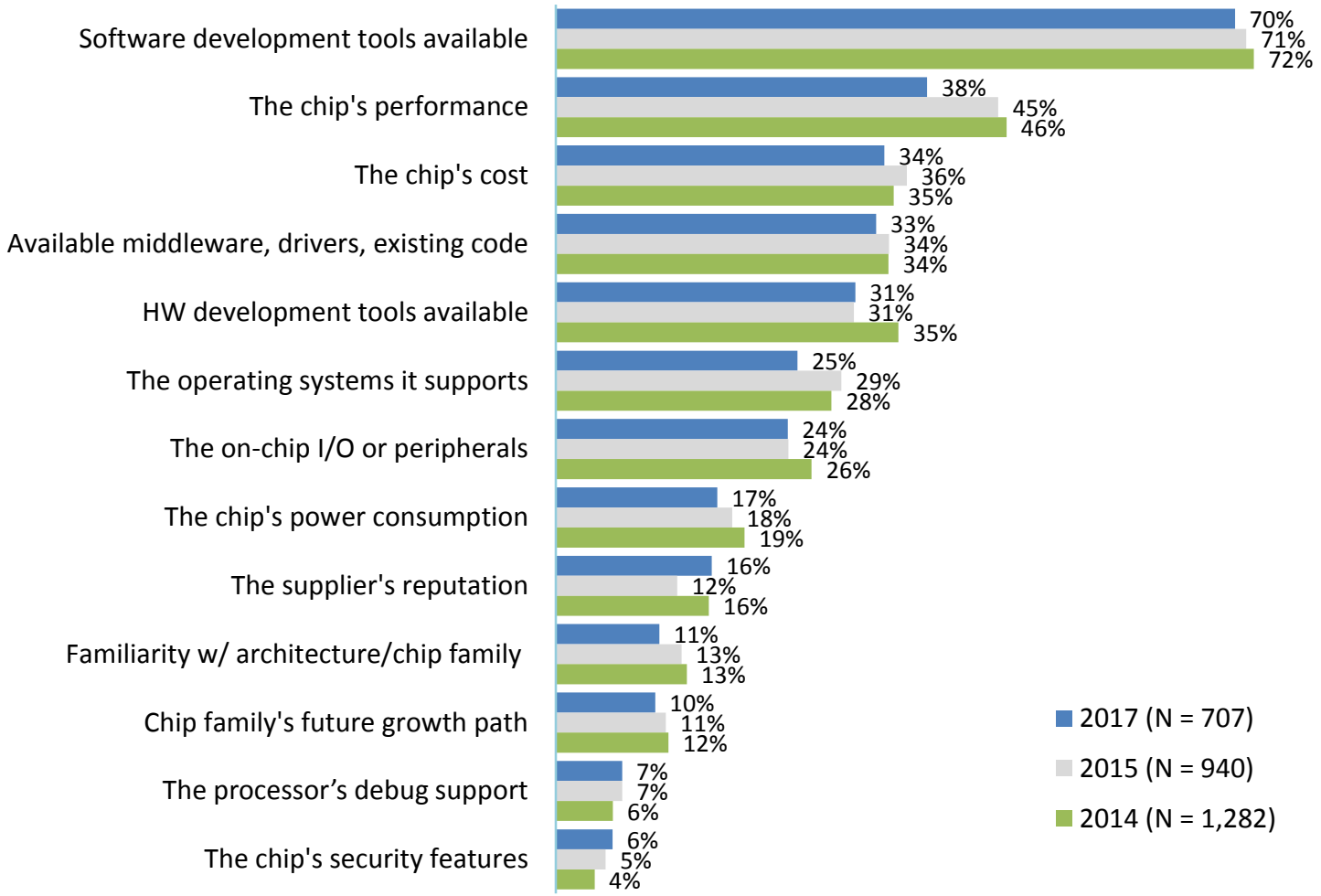
What's most important when choosing a microprocessor?



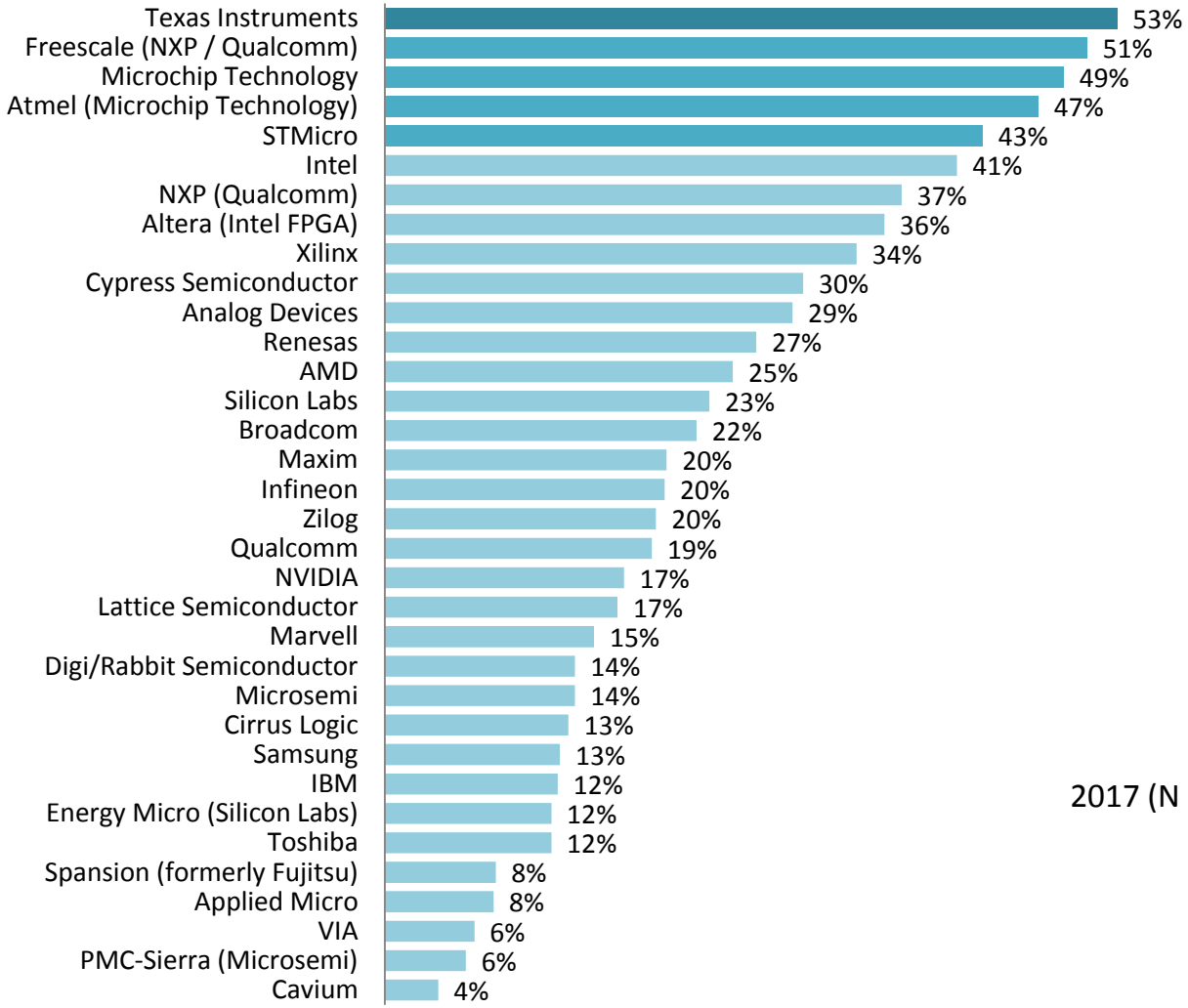
Which vendor has the best ecosystem for your needs?



What are the most important factors in choosing a processor?

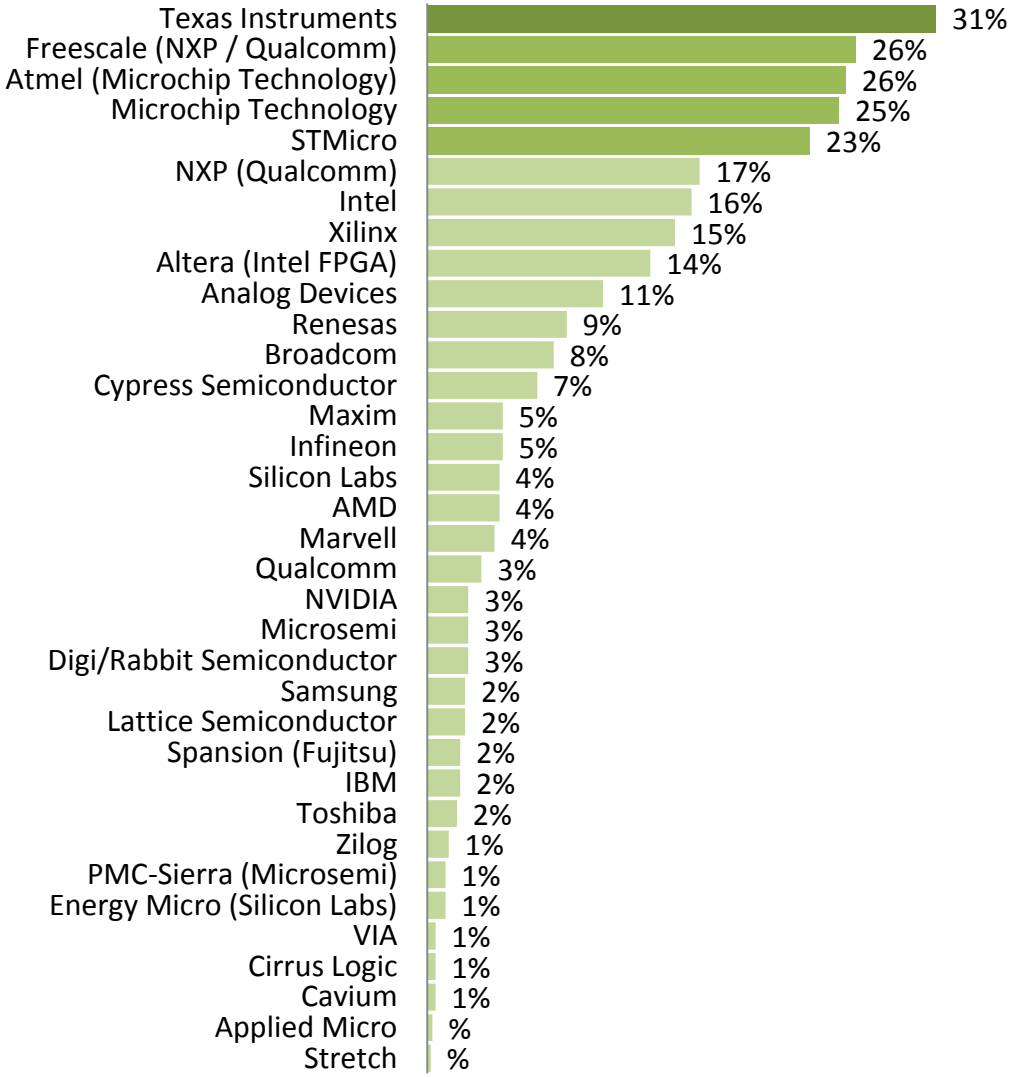


Please select the processor vendors you are familiar with.



2017 (N = 651)

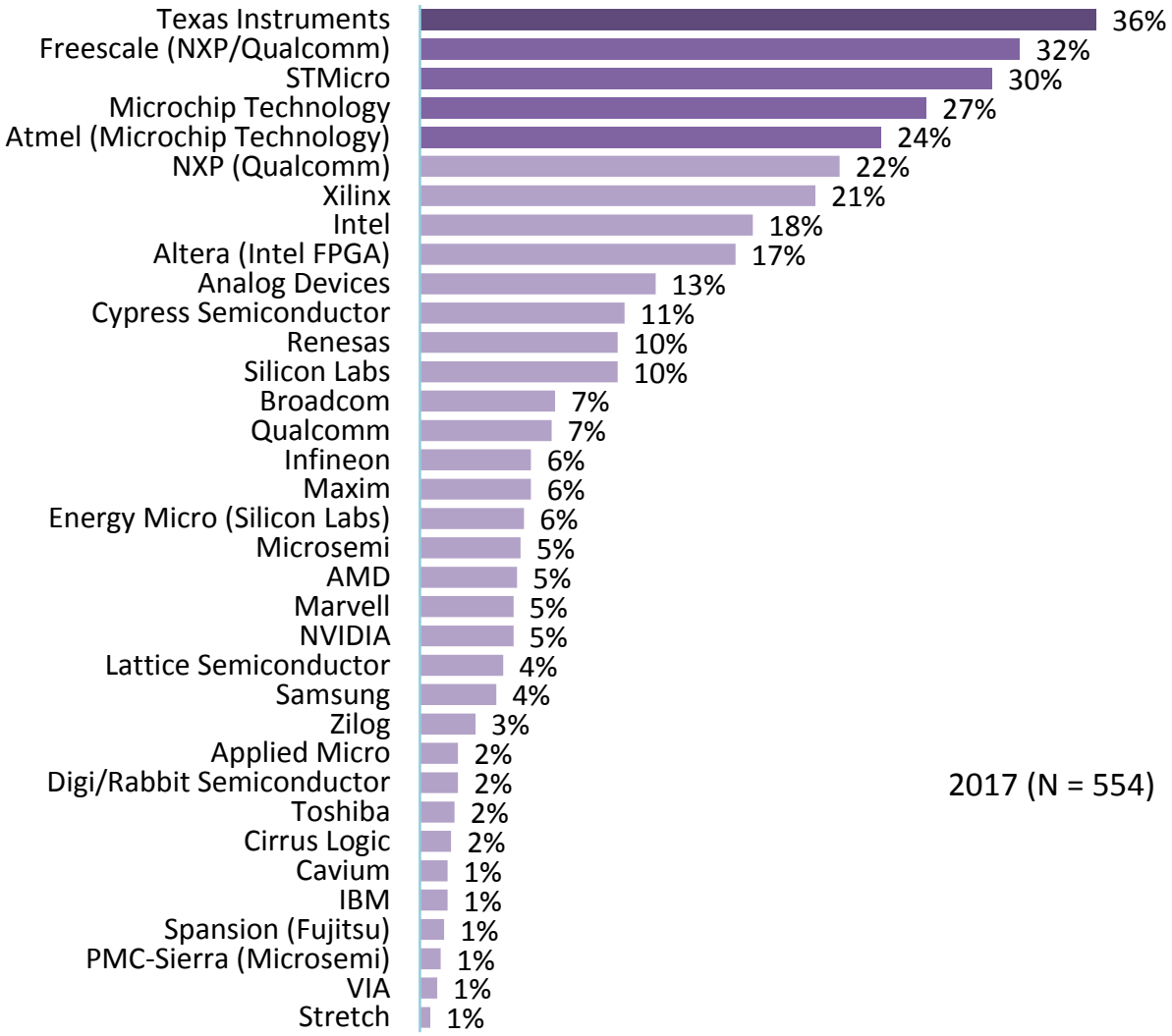
Please select the processor vendors you are currently using.



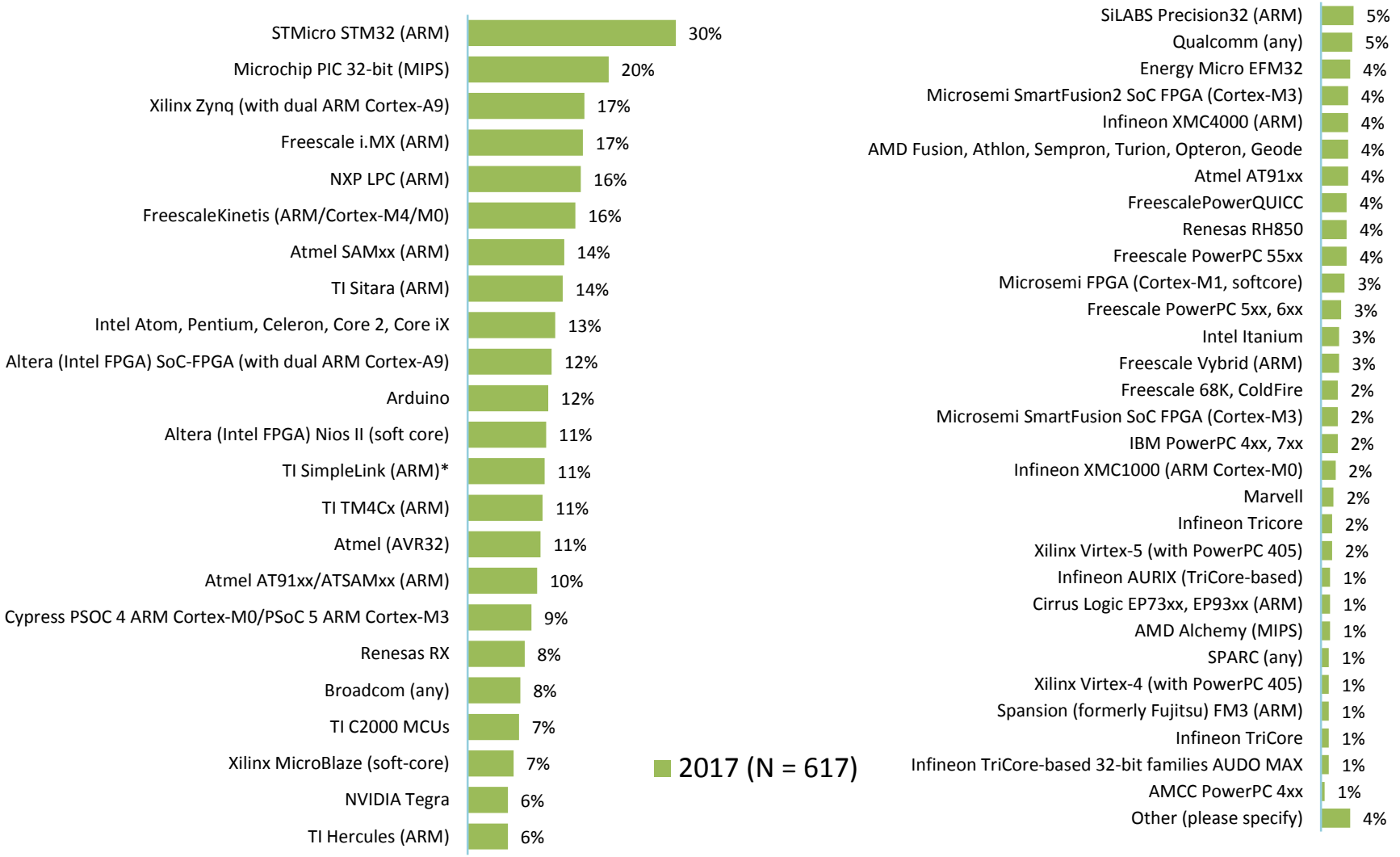
2017 (N = 609)

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

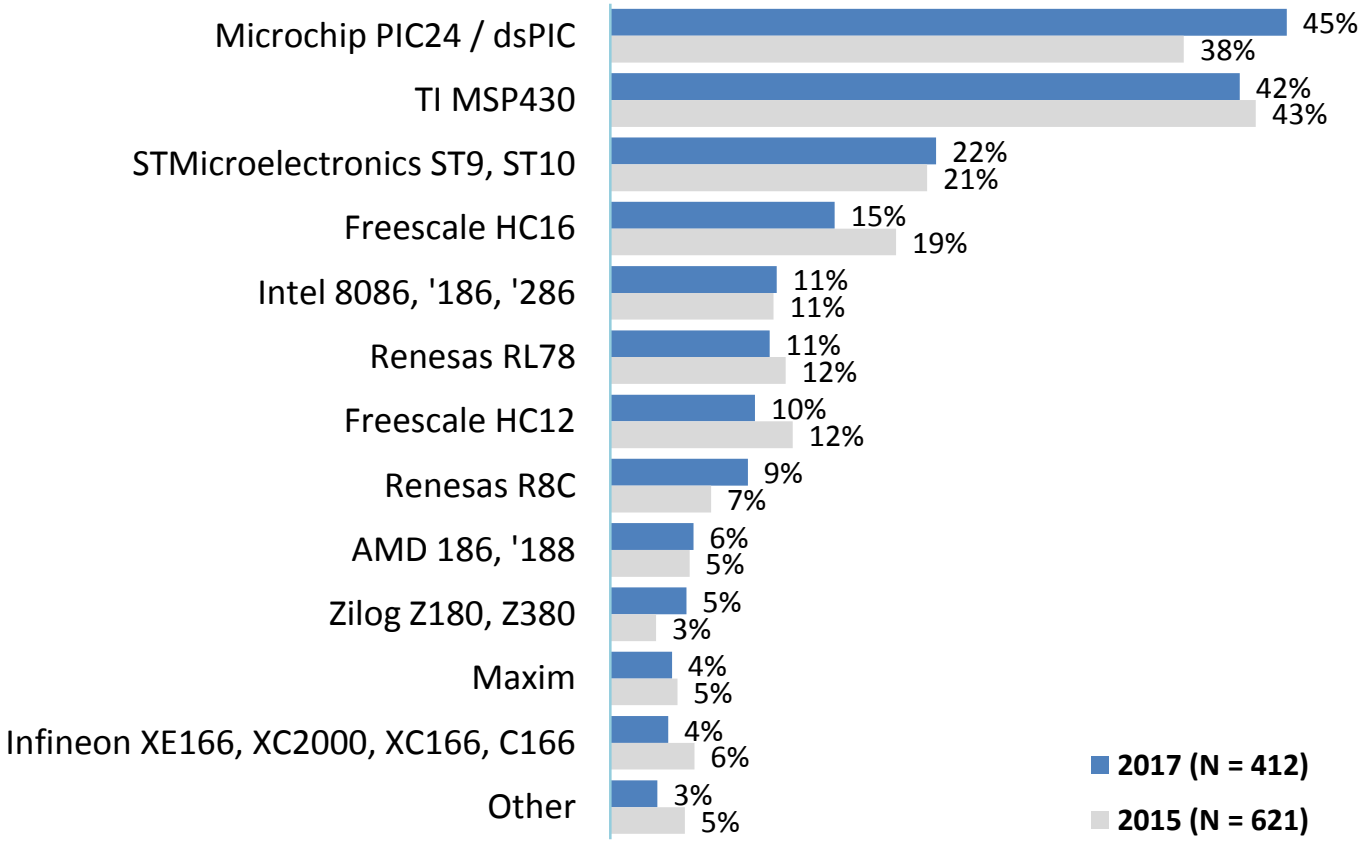
ASPENCORE



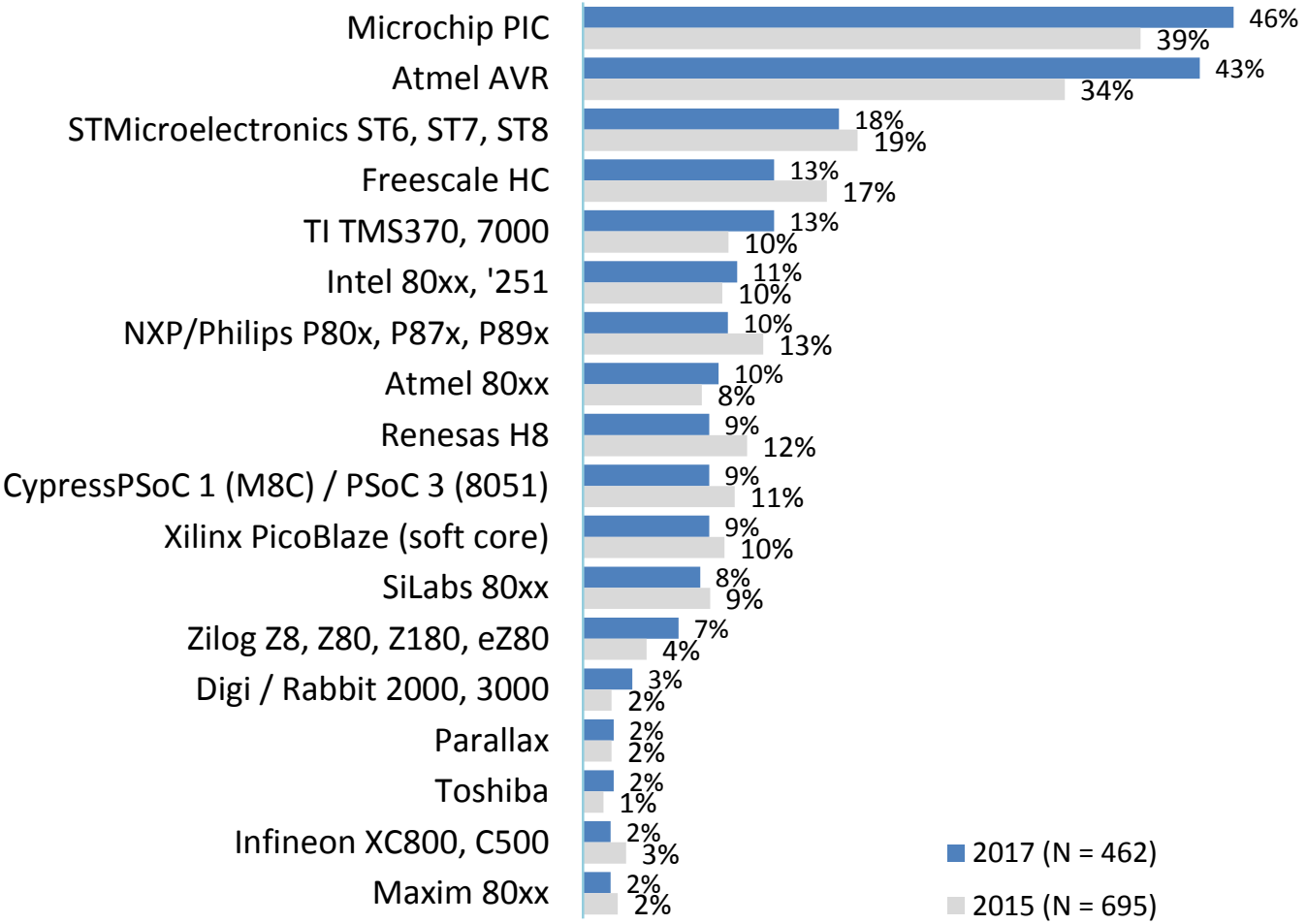
Which of the following 32-bit chip families would you consider for your next embedded project?



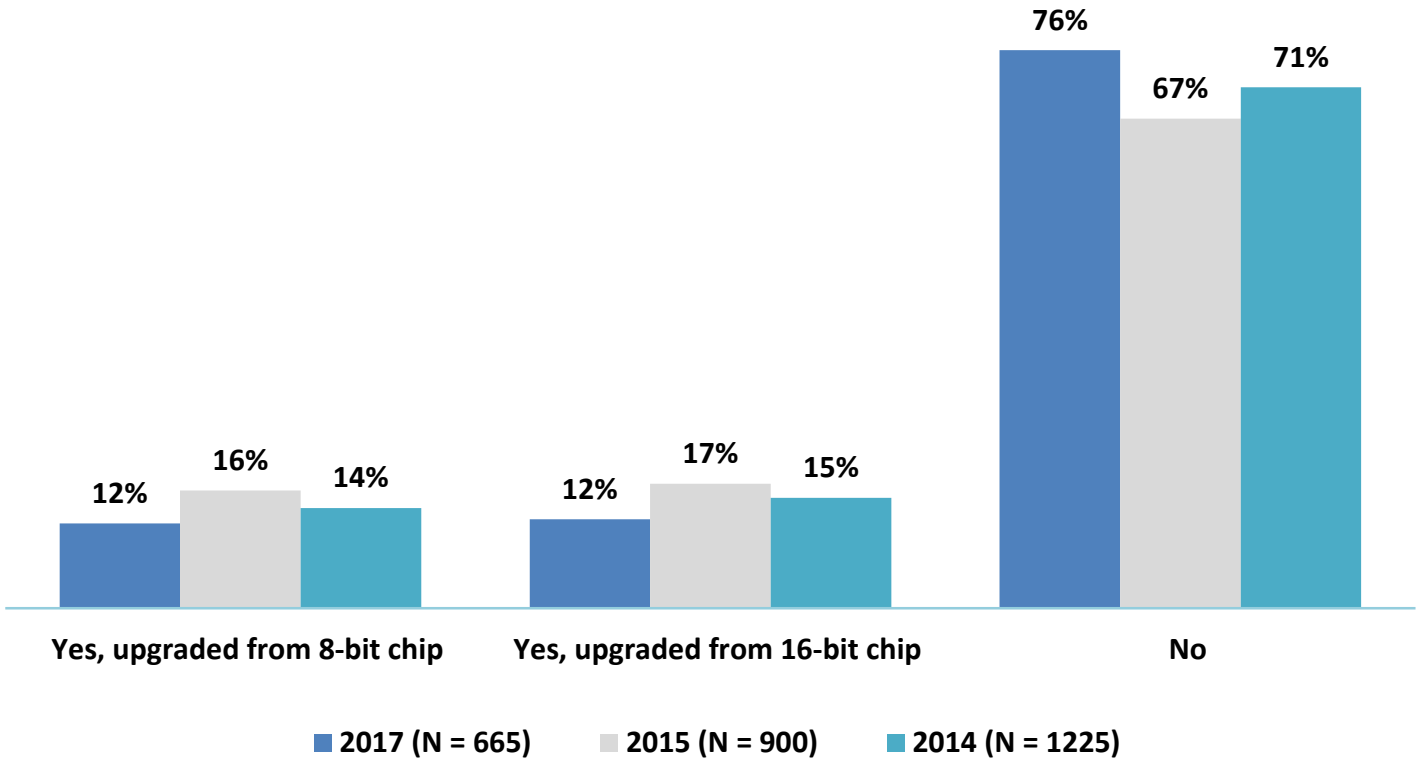
Which of the following 16-bit chip families would you consider for your next embedded project?



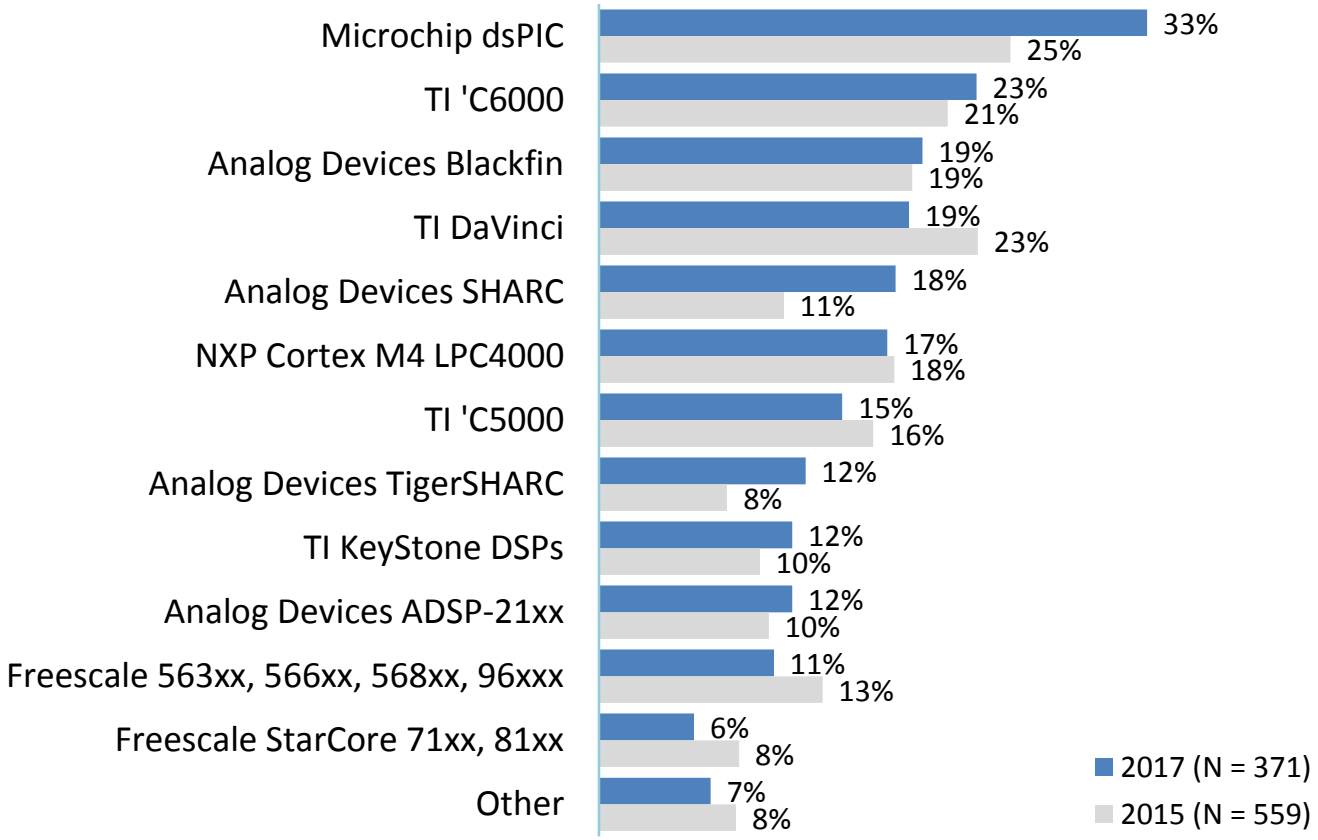
Which of the following 8-bit chip families would you consider for your next embedded project?



Have you upgraded from an 8-bit or 16-bit chip to a 32-bit design in the last 12 months?



Which of the following DSP chip families would you consider for your next embedded project?



Microprocessors

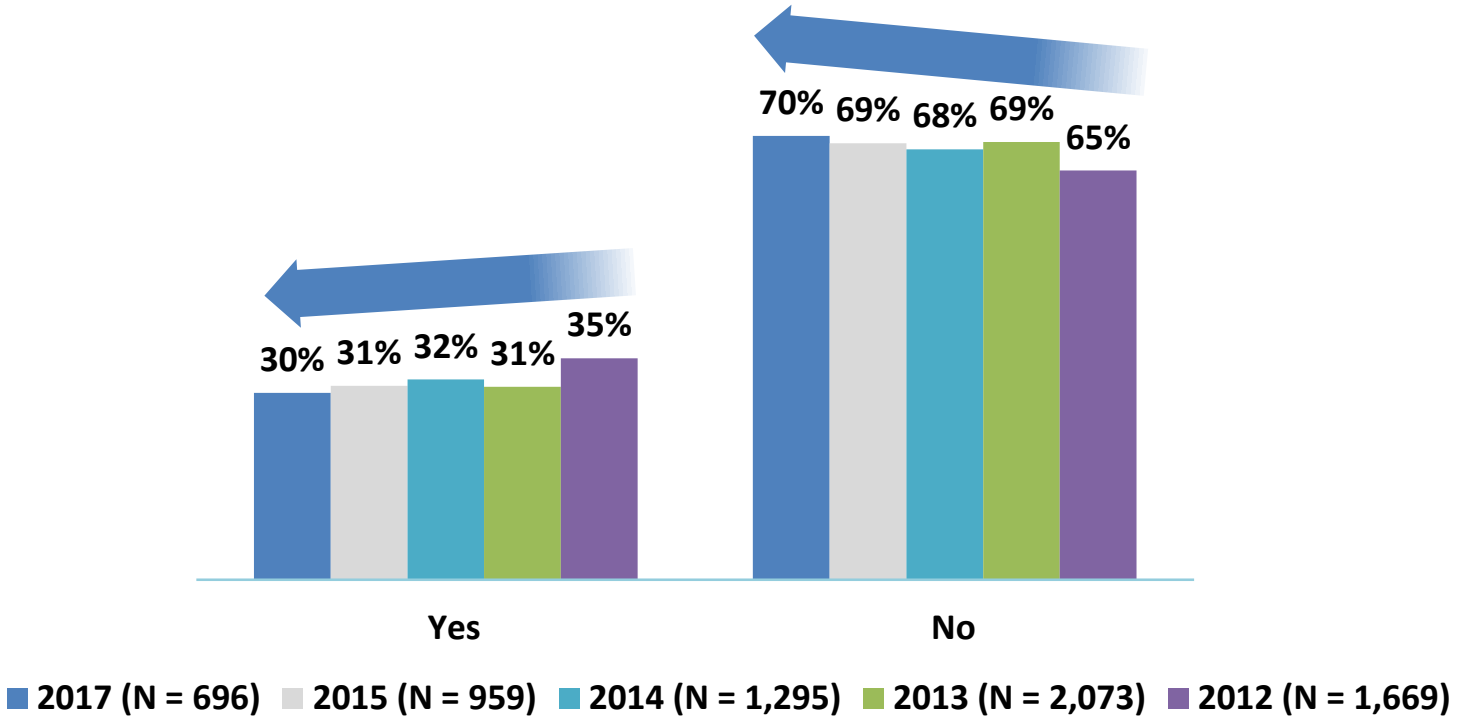
ASPENCORE

- **Deciders for chips –** Hardware engineers (28%) and engineering group (26%)
- **Single chip usage –** 56% down a little from 2015. 2.3 chips per design on average.
- **Chip Type –** In 2017: 32-bit (63%), 64bit (13%) 16-bit (9%), 8-bit (12%).
- **Clock speeds –** Now 445 MHz, up from 397 MHz in 2015, more in line with 2014, 2013.
- **Same processor used –** Now 47%, down from 50% in 2015. Happy with it, compatibility, same tools.
- **Family –** 55% chose main chip from different family, 46% different processor from the same family.
- **Ecosystem –** 68% say "ecosystem" outweighs "the chip" (25%). Best ecosystem is Microchip and TI.
- **Important in chip decision –** Software development tools (70%), chip performance (38%)
- **Top 5 Vendors Familiar With –** TI, Freescale, Microchip, Atmel, STMicro
- **Top 5 Vendors Currently Using –** TI, Freescale, Atmel, Microchip, STMicro (same as 2015)
- **Top 5 Vendors Considering Using –** TI, Freescale, STMicro, Microchip, Atmel (same as 2015)
- **Top two 32-bit chips considering –** STMicro STM32 (ARM), Microchip PIC 32-bit (same as 2015)
- **Top two 16-bit chips considering –** Microchip PIC 24 (dsPIC) and TI MSP430 (reversed from 2015)
- **Top two 8-bit chips considering –** Microchip PIC and Atmel AVR same as 2015 and 2014
- **Upgraded from 8 or 16-bit to 32-bit –** 12% from 8-bit, 12% from 32-bit. No = 76%.
- **Top two DSP chips considering –** Microchip dsPIC and TI 'C6000 (replaced TI DaVinci).

ASPENCORE

FPGA CHIPS

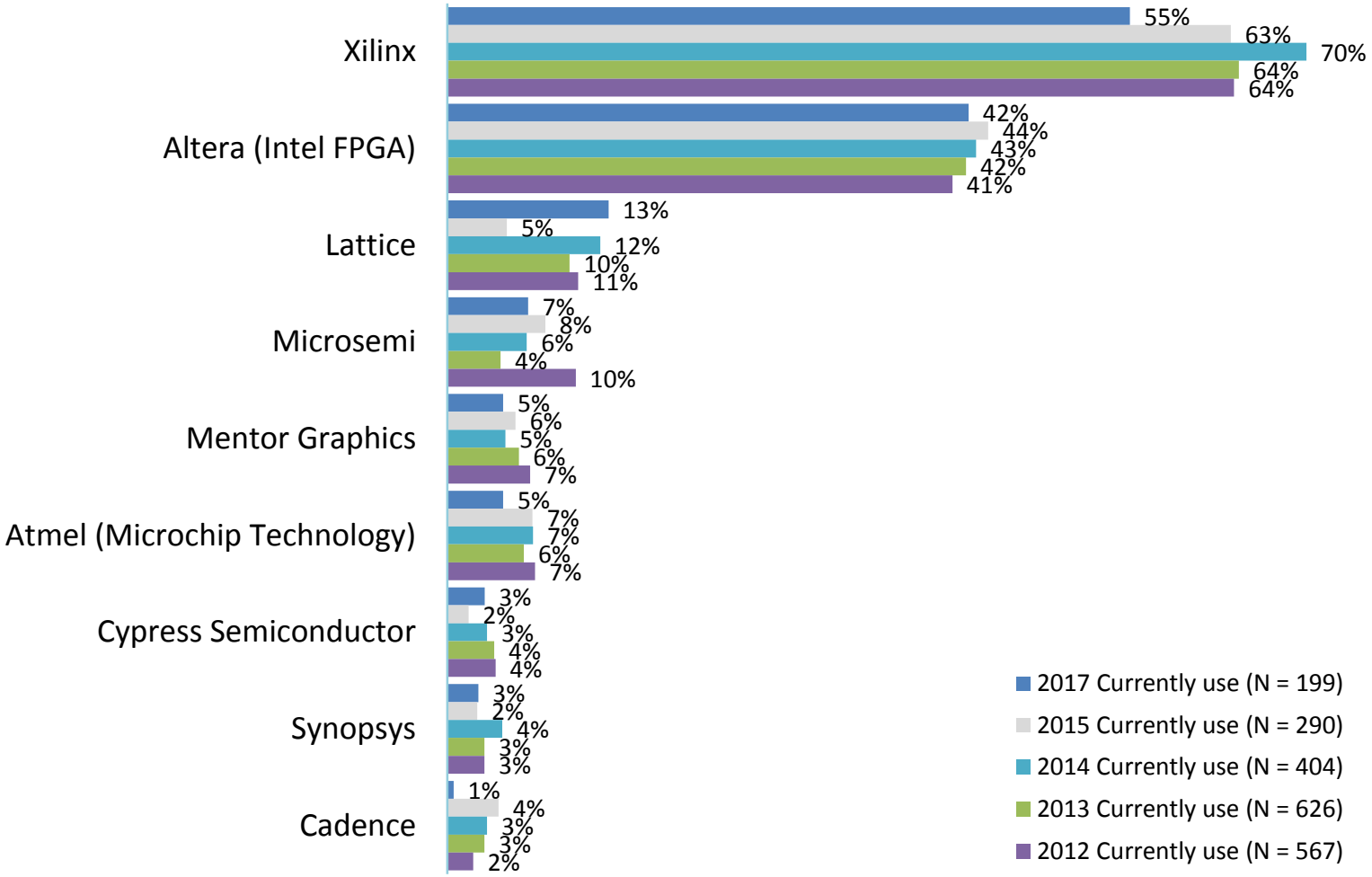
Does your current embedded project incorporate an FPGA chip?



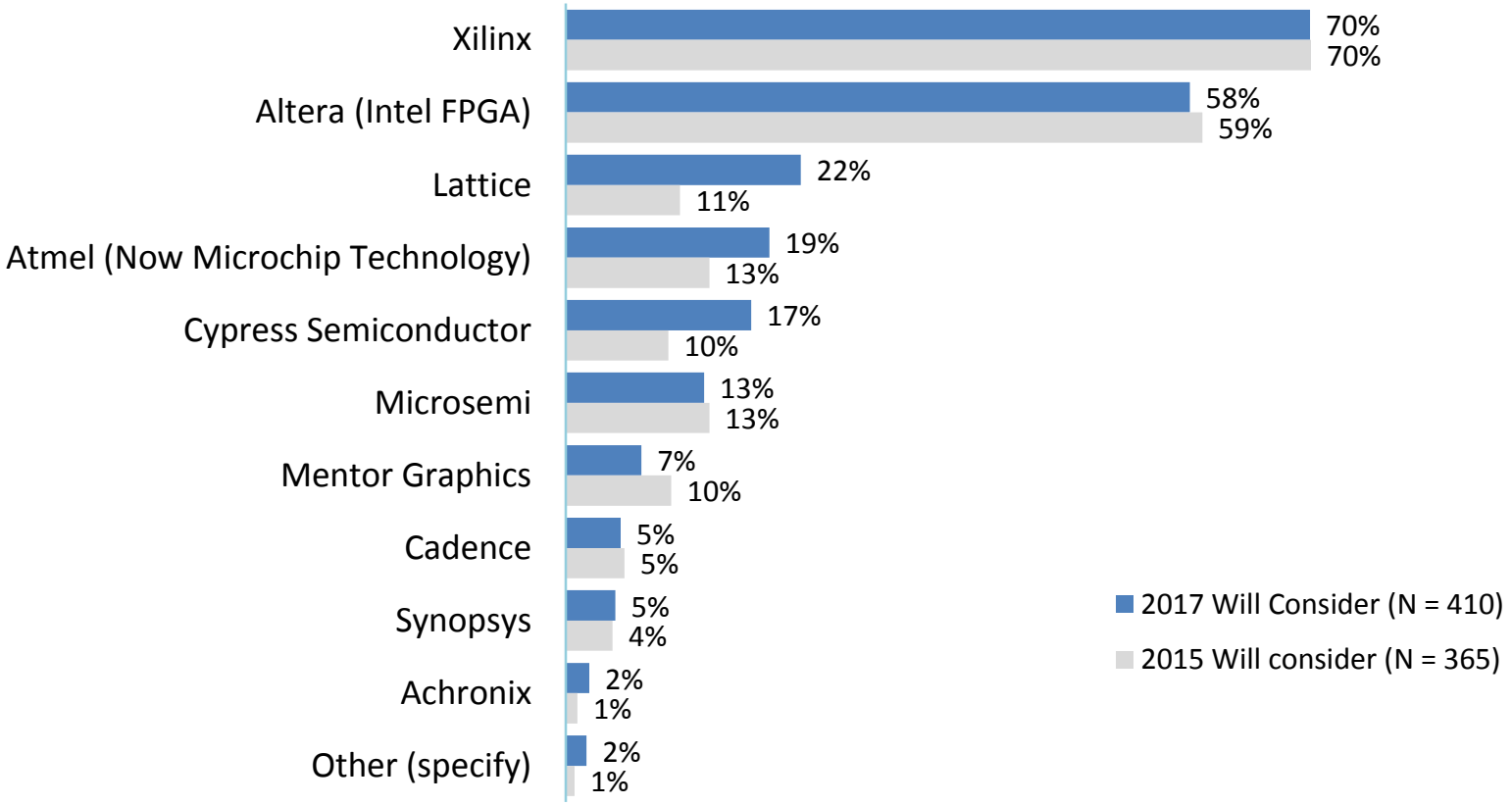
Note 1: Among those not using FPGAs, only **12%** said the trend towards FPGAs with built in multicore processors would change their mind, and 51% said "maybe" it would. And 37% said it would not change their mind.

Note 2: Only **25%** of all respondents said they would use an FPGA in their **next** project further supporting the downward trend in using FPGAs. Those not using FPGAs in the future say they don't need the functionality, the cost of FPGAs is too high, or they consume too much power.

Which of the following vendors does your current embedded projects use for FPGAs?



Which of the following FPGA vendors will you consider in your next embedded project?



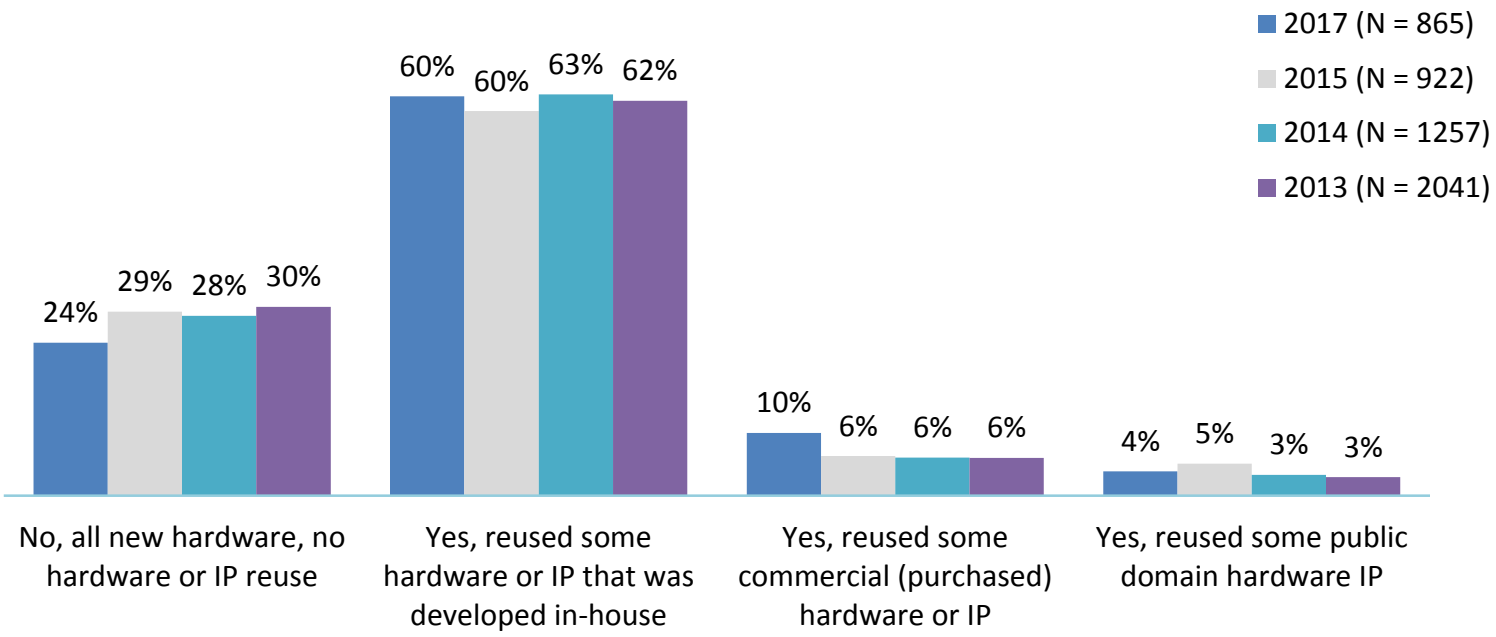
FPGAs, Memories, LCDs

ASPENCORE

- **Current FPGA usage –** 30% used in current project, continuing a downward trending.
- **Next Project FPGA usage –** 25% will likely use an FPGA in their next project,.
- **Why FPGAs NOT used –** Don't need this functionality, too expensive, use too much power, and too difficult to program.
- **Built-in Multicore Trend –** 12% say it encourages use of FPGAs
- **Vendors currently used –** Xilinx (55%) and Altera (42%) dominate and Lattice is 13%.
- **Vendors will consider –** Xilinx (70%) and Altera (58%). Altera/Intel and Atmel/Microchip mergers portend a possible challenge to Xilinx.

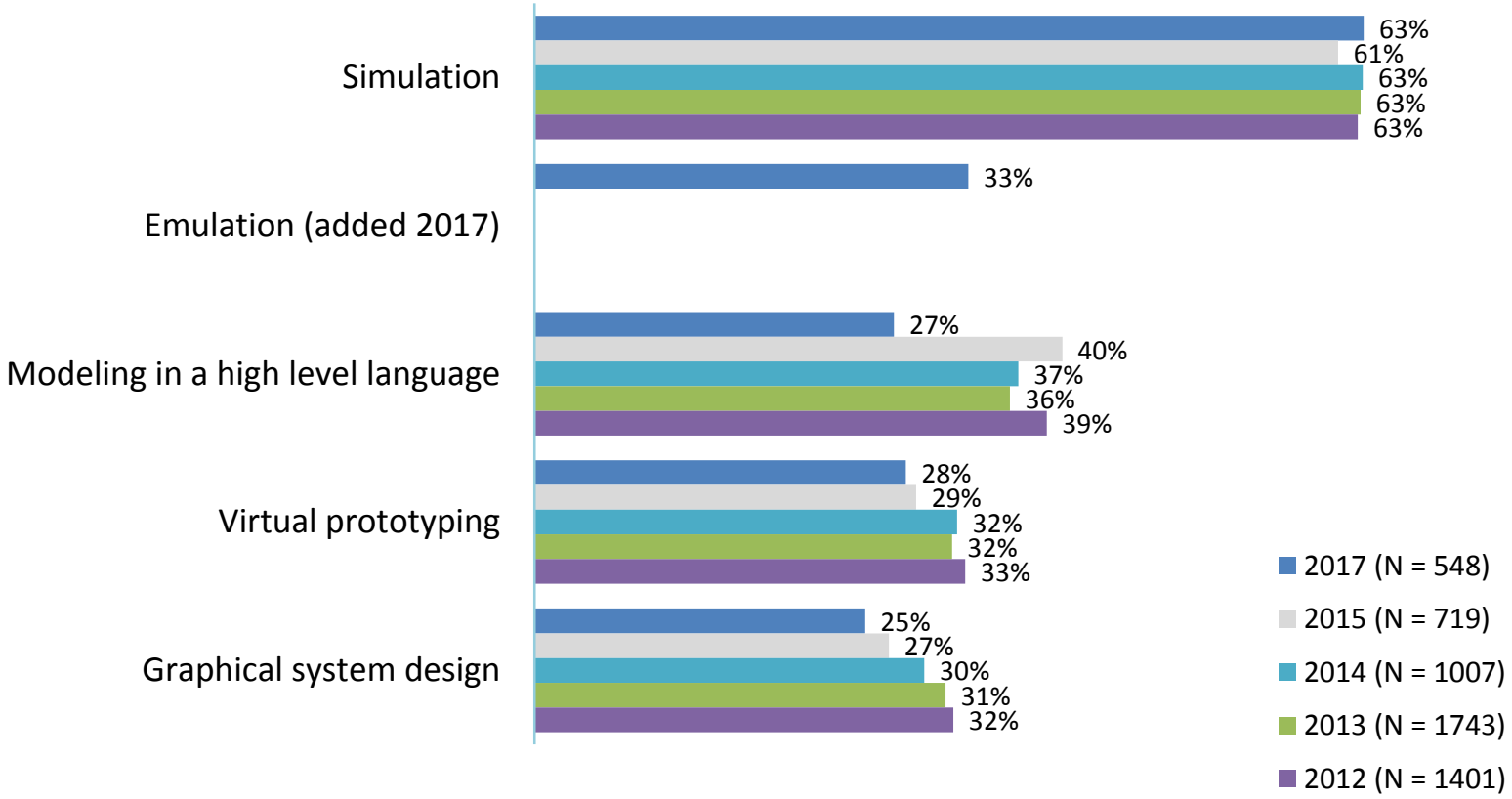
Hardware IPs, System Level Design & GUIs

Does your current embedded project reuse hardware or hardware IP from a previous project?

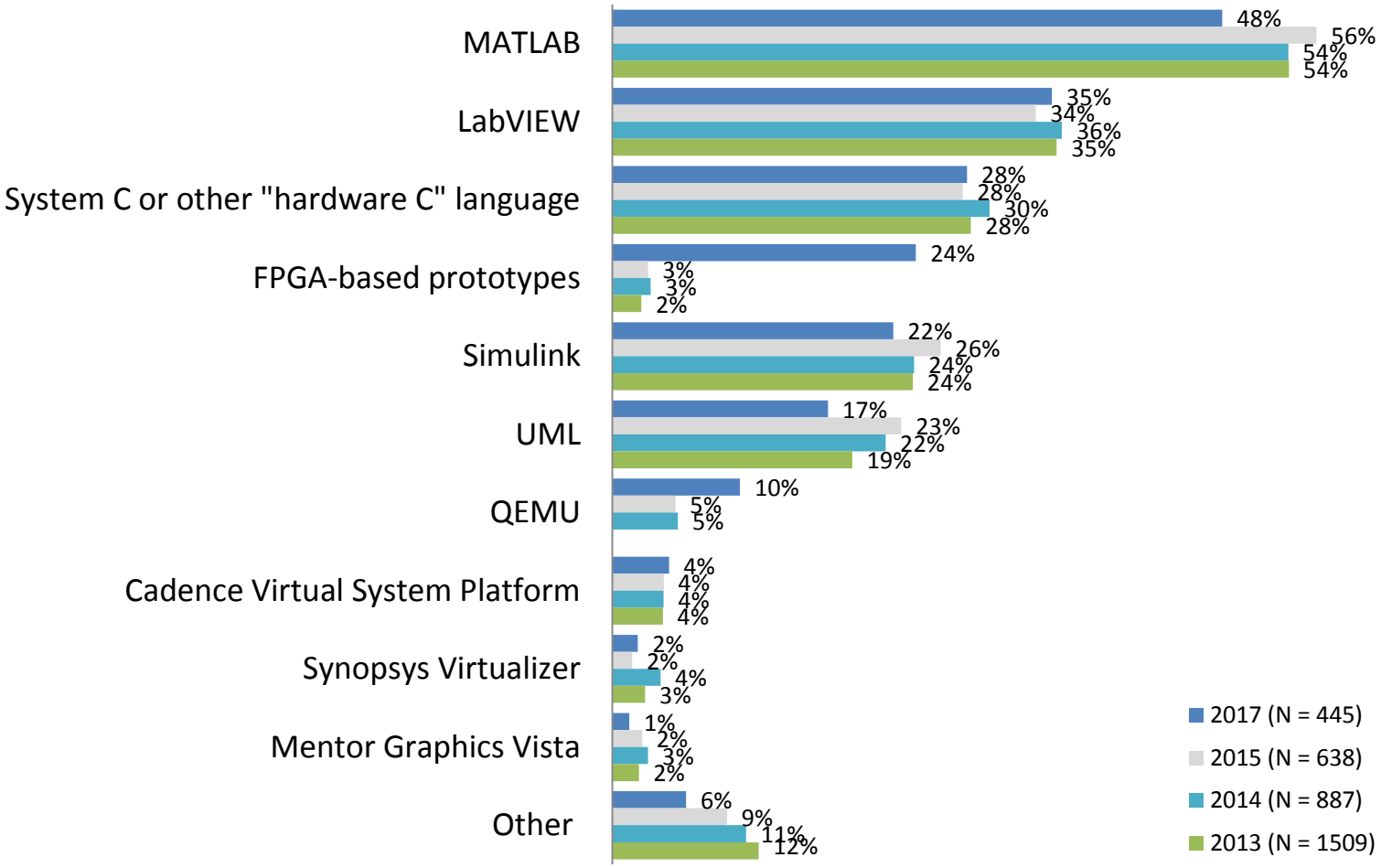


Over three quarters of embedded developers reuse hardware or hardware IP and 7 in 10 have been doing so for the last five years. Six in ten reuse hardware or hardware IP that was developed in house.

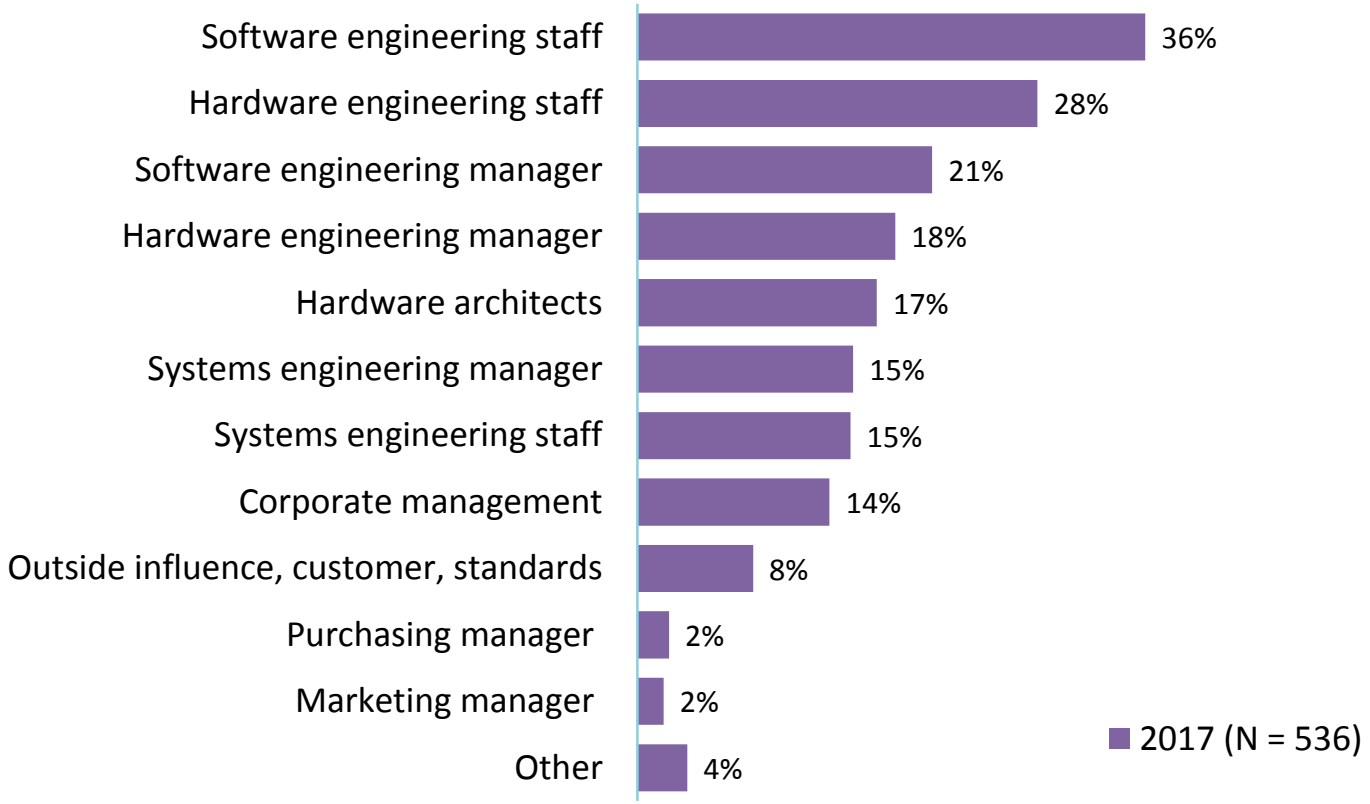
Which of the following design techniques will become more important to your designs in the future?



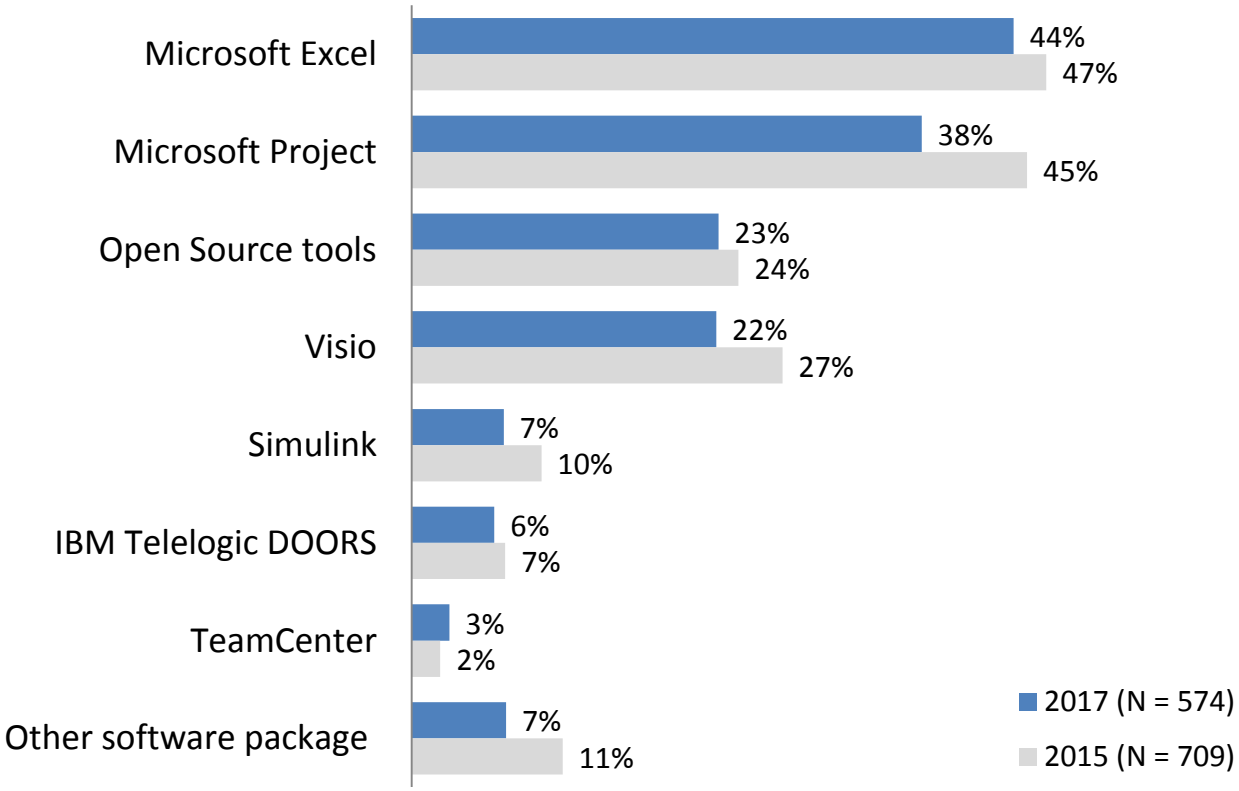
What system level design tools do you or your organization currently use?



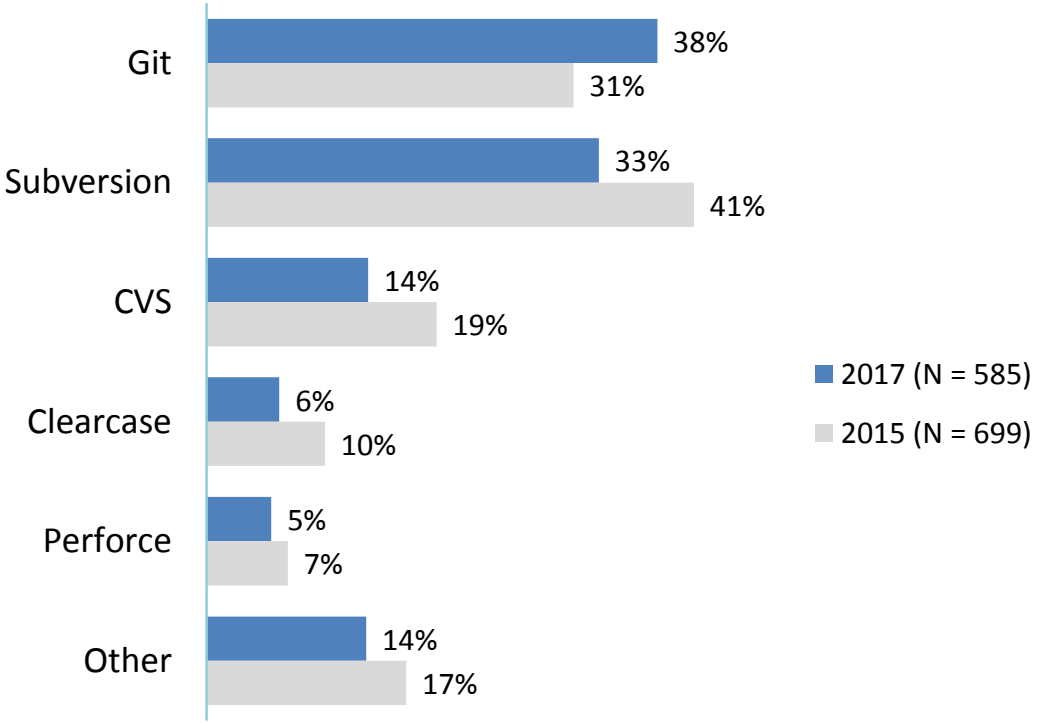
Who were the three greatest influencers on the choice of the system-level tools for your current project?



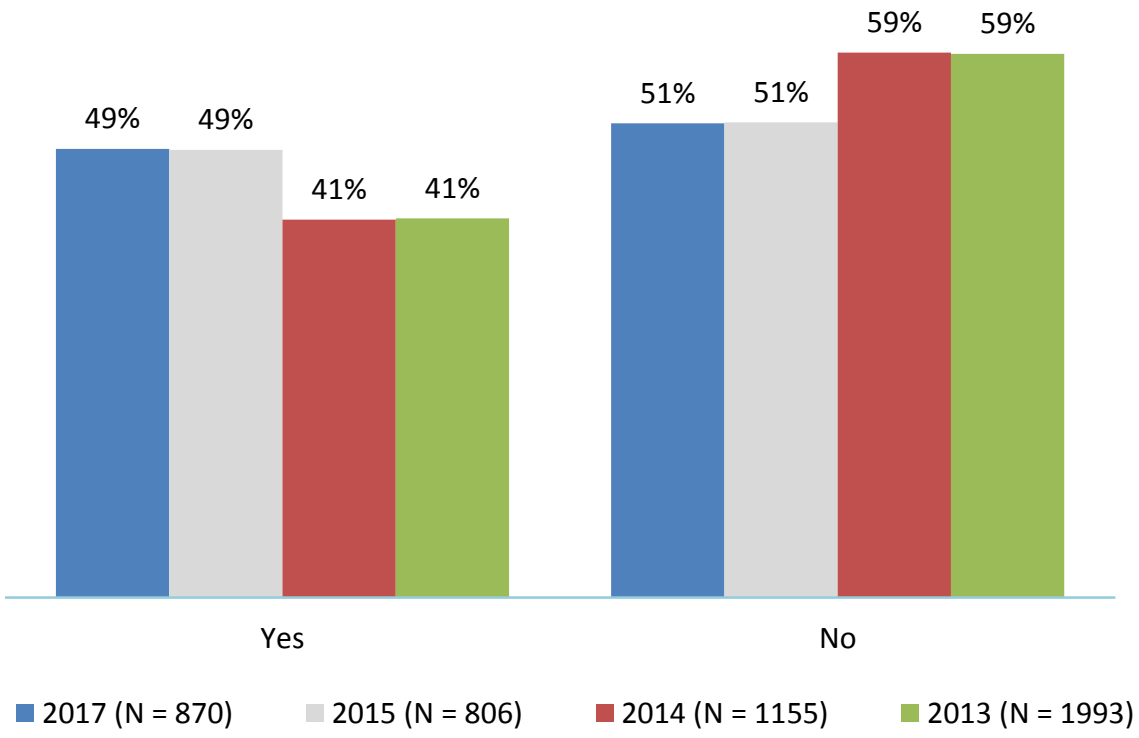
Which of the following project management software packages do you currently use?



Which of the following Version Control software systems do you currently use?



Does your current design use a graphical user interface?



Hardware IPs, System Level Design, GUIs

ASPENCORE

- **Reuse of Hardware/Hardware IPs –** 76% up from 71% reuse in 2015.
- **Design Techniques Becoming More Important –** Simulation (63%), emulation (new om 2015) (33%) and modeling high level language (27%).
- **System Level Design Tools Used –** MATLAB (48%) is the big leader followed by LabVIEW (35%), System C (28%) and FPGA based prototypes (24%).
- **Deciders of Systems Level Tools –** Software engineers (36%) and hardware staff (28%) are the top influencers
- **Project Management –** Excel (44%) & Microsoft Project (38%) are tops.
- **Version Control Software –** Git (38%) switched places with Subversion (33%), and CVS (14%) is a distant third.
- **GUI usage –** Stayed even at 49% in 2017.

THANK YOU!