SKILL UP

LEARN MORE TO EARN MORE

APP DEVELOPMENT SALARY & SKILLS REPORT

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‘WHAT YOU NEED TO KNOW TO EARN MORE IN APPLICATION DEVELOPMENT’

THE MOST COMPREHENSIVE GLOBAL IT SALARY AND SKILLS SURVEY EVER.

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For companies and people all over the world, application development has evolved and continues to do so. How you do you keep up with current trends and ensure you have the latest skills to forge ahead in your career?

- Are desktop skills still required?
- Which is the most popular platform for application development?
- Is functional programming the way of the future?
- Which is the essential software choice for professional game development?

The need to answer these questions led us to look at the community as a whole, and so we decided to launch our Skill Up campaign.

WHAT IS SKILL UP?

With our Skill Up survey we wanted to look at the tech community as a whole to identify upcoming trends over the next few years and share what you can do to ensure you get the most out of your career and skills. We divided our survey into 4 segments, Web Development & Design, Application Development, Security & System Administration, and Data Science & Business Intelligence, making this one of the most comprehensive surveys in recent years.

Specifically we asked:

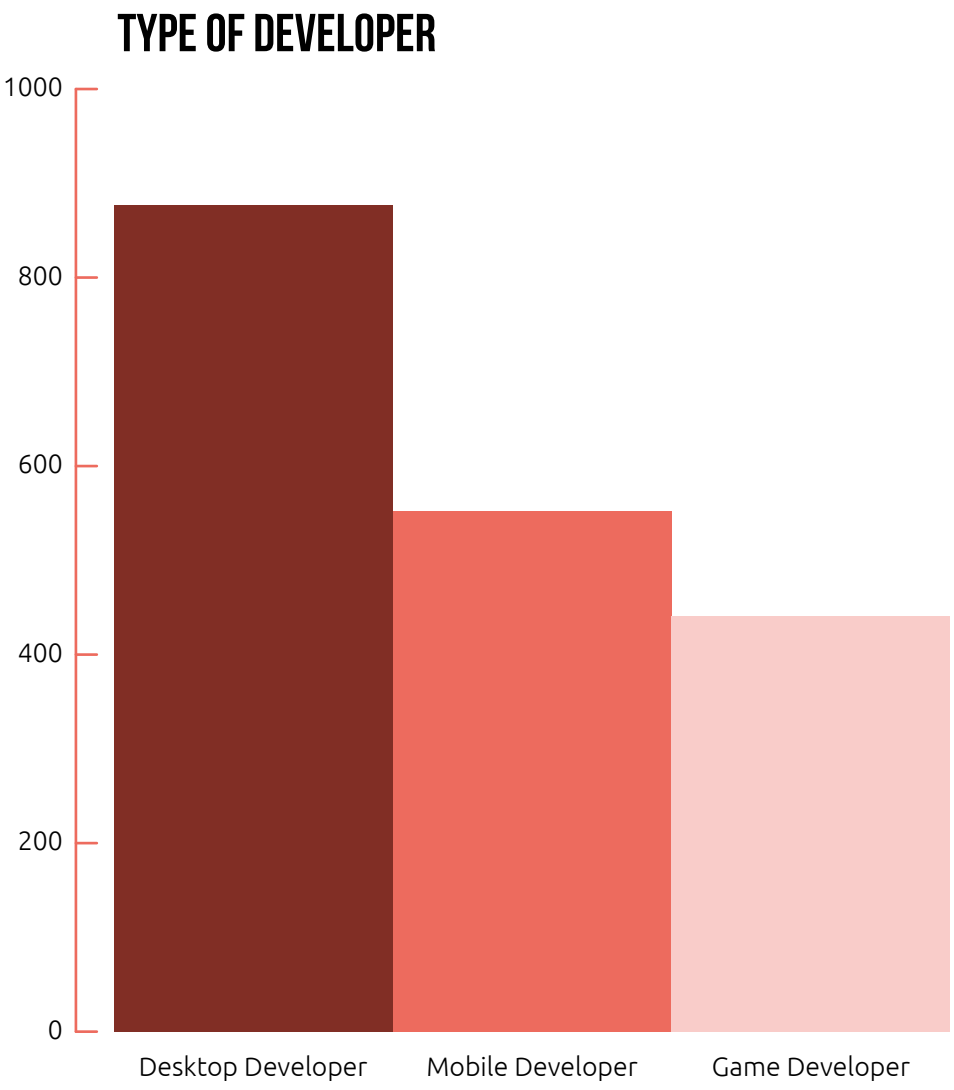
- What skills lead to a higher salary?
- What skills/technologies are most highly valued by different industries?
- What cutting edge technologies are really worth you spending your time learning?

To get a better idea of the community's thoughts we asked you all to fill in our survey, the results of which you can find compiled here in this report, giving you the facts, the figures, and more importantly – the knowledge and skills you need to make the best career decisions.

Let's look at the results in more detail.

WHAT ARE PEOPLE BUILDING?

The majority of application developers are building applications for desktop so this is still super important in the age of mobile! After desktop developers, most application developers are either involved in mobile development or game development.



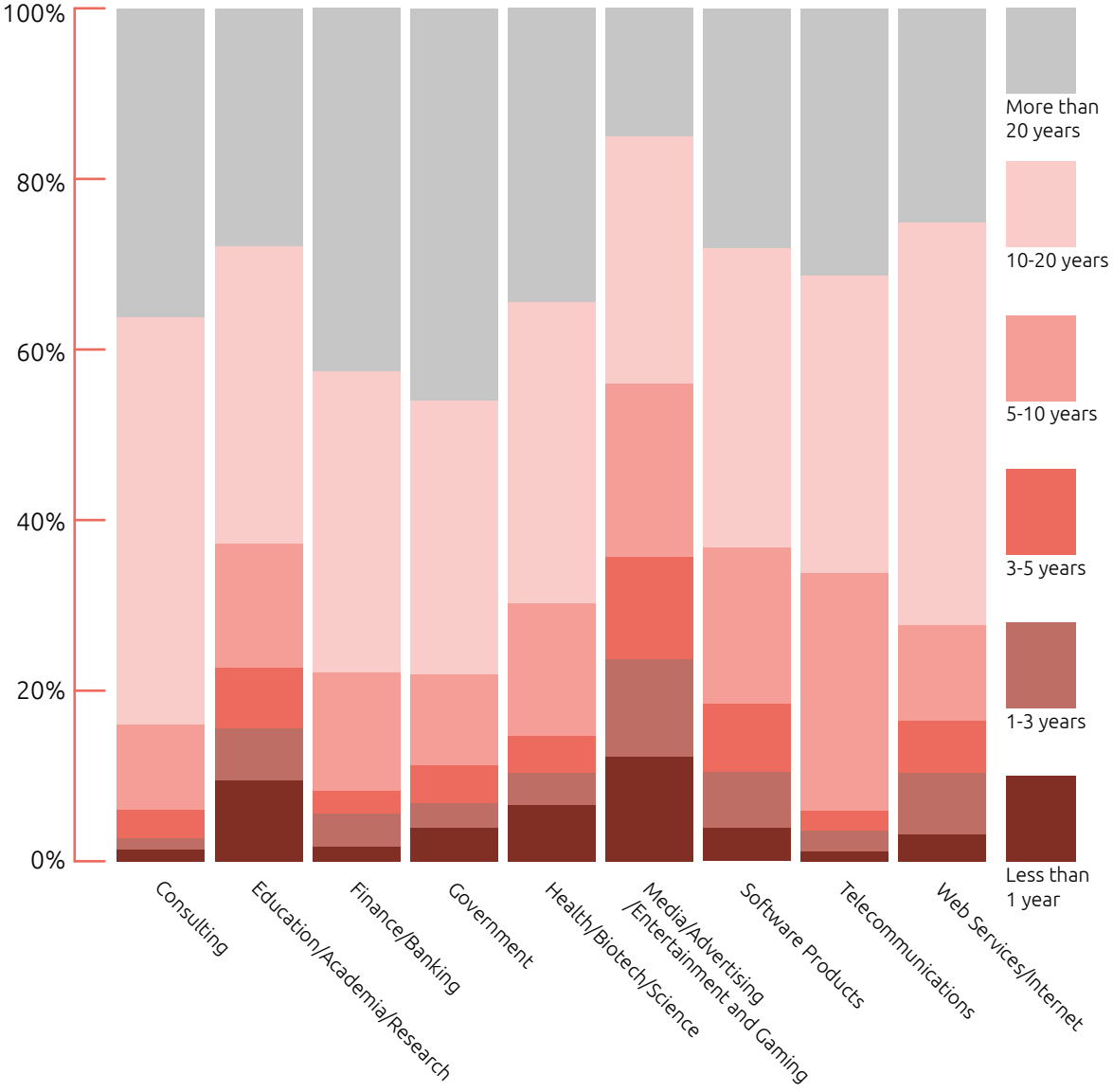
WHICH INDUSTRIES HAVE THE MOST EXPERIENCED DEVELOPERS?

- The Media and Entertainment sector has the highest proportion of less-experienced developers.
- The Finance sector is dominated by highly-experience developers with many years of experience.

If you're new to the world of application development and taking your first steps in the industry what's the best place to start looking in order to get your first job?

Our survey shows that many industries are mostly composed of developers with over ten years' experience. Finance has the most old-hands, with almost 80% of finance developers having over a decade of experience. At the other end of the scale, the Media/Advertising/Entertainment and Game Development industries were filled by less experienced individuals. Almost 25% of respondents in these sectors had less than 3 years development experience.

INDUSTRY BY EXPERIENCE

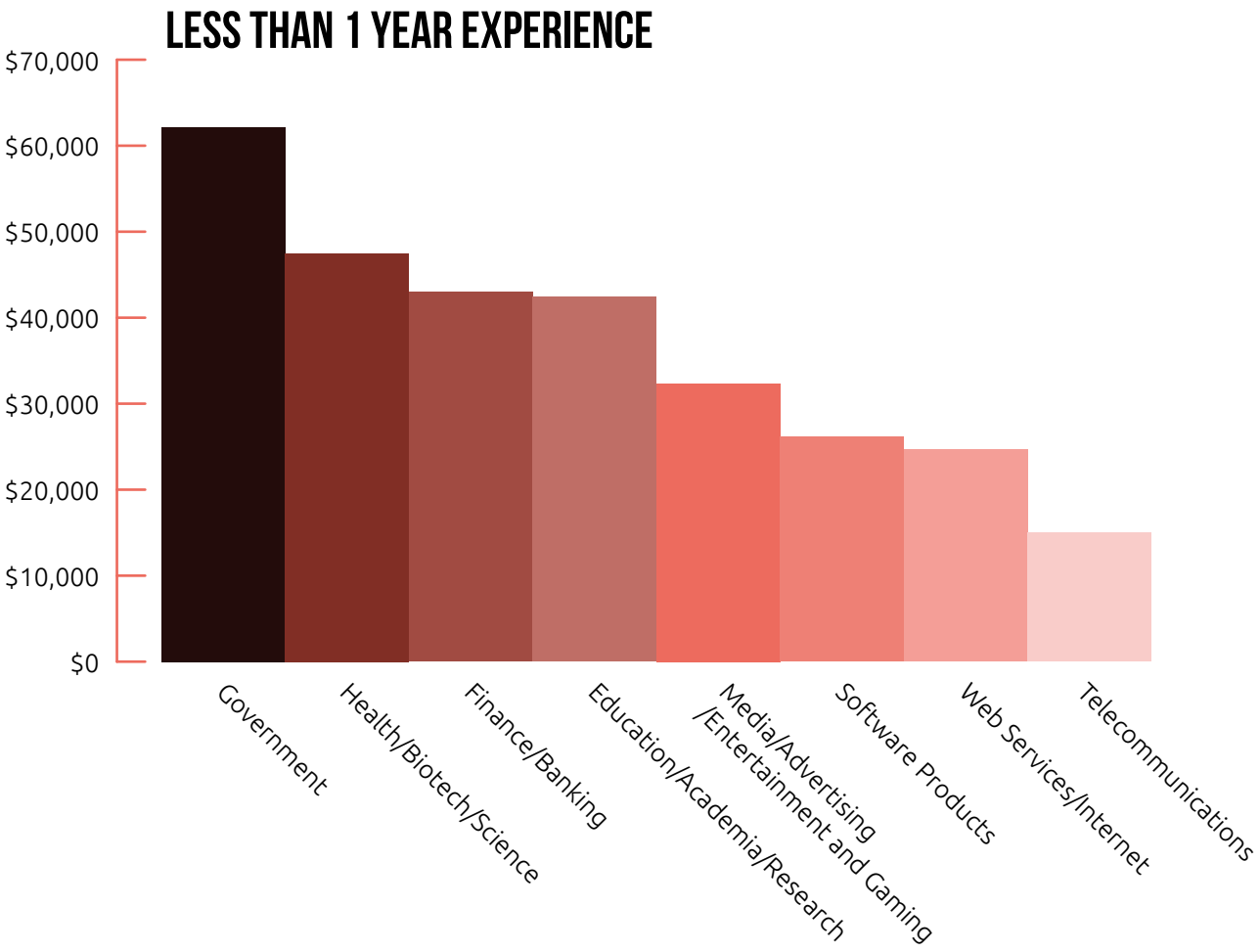


WHERE SHOULD YOU GET YOUR FIRST JOB IN APP DEVELOPMENT?

The Government sector affords the best salaries to less experienced developers, though it is very competitive with only a few jobs available for those with less experience. Enterprise and SME-level companies pay the best to less-experienced developers, over Start Ups. Mobile developers working in the Entertainment industry can earn high salaries.

WHAT INDUSTRY SHOULD YOU GET INTO?

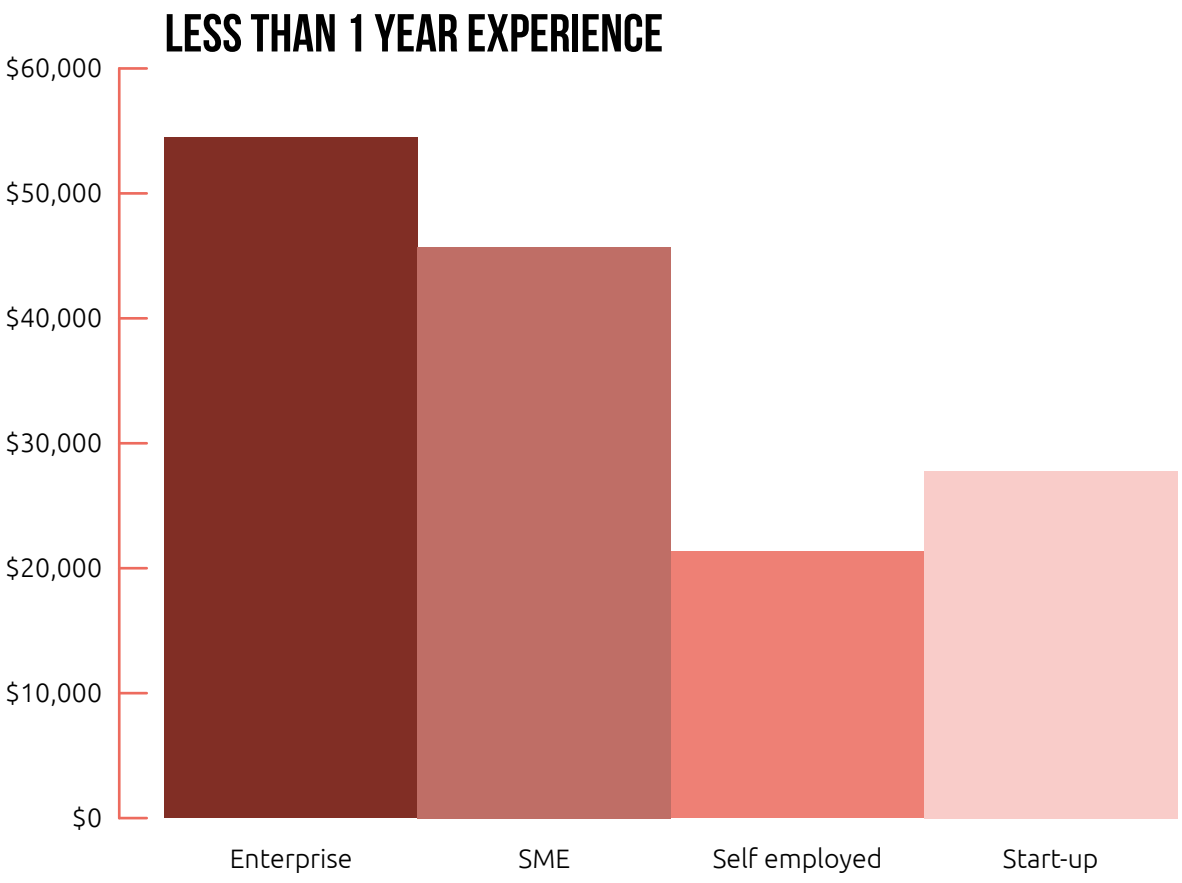
If you're getting started in the industry and want a decent first salary, the best place to look is in the Government sector.



If you manage to bag a government job, you won't regret it! That said, competition for positions is fierce with only 5% of developers in the Government sector having less than three years' experience. If you don't fancy all that competition, why not look to the Financial sector or developing for Science; both offer a great starting salary.

WHAT SORT OF COMPANY SHOULD YOU WORK FOR?

Now you have your industry in mind, what kind of company should you start applying to join?



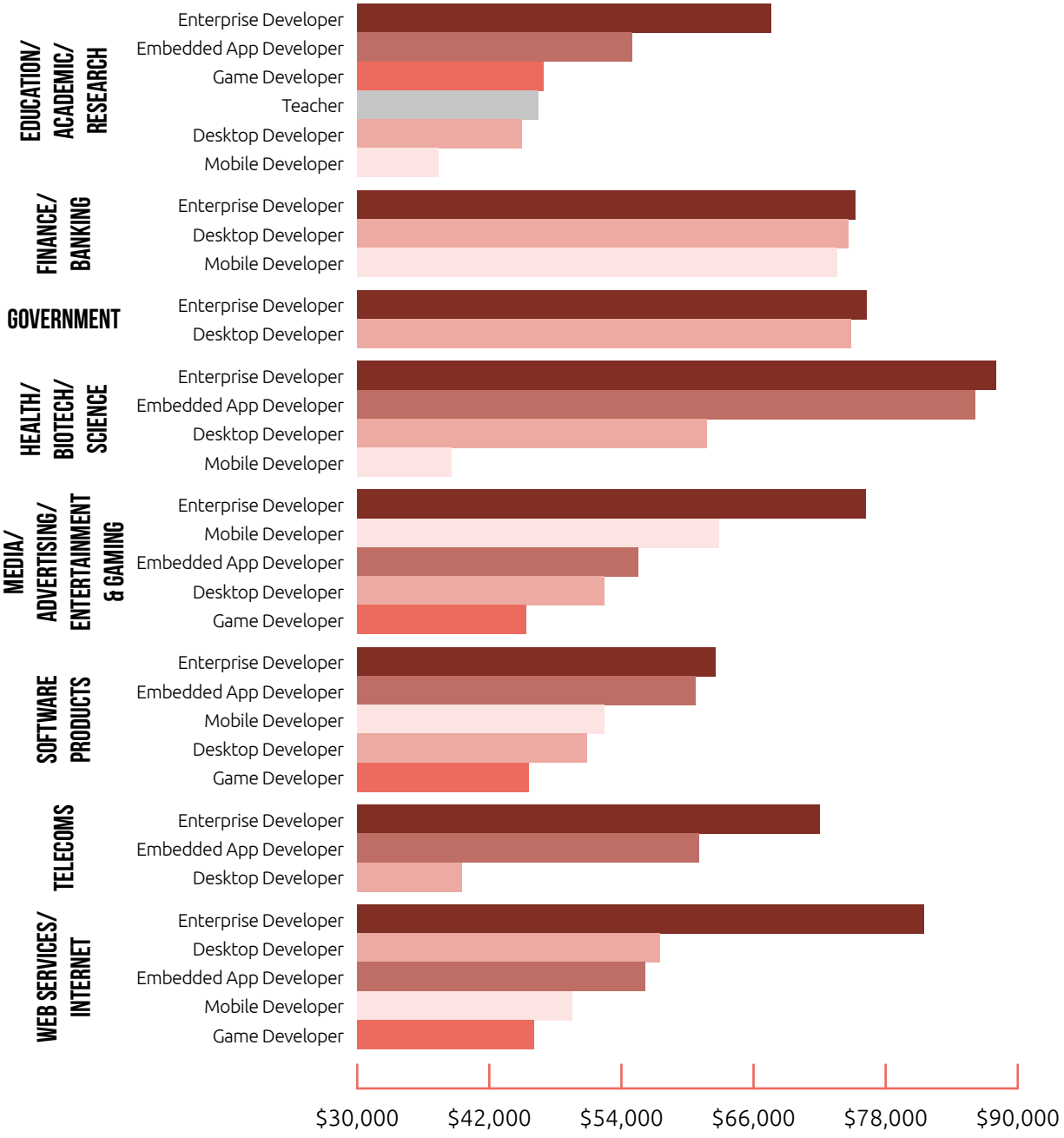
Enterprise and Small-to-Medium Enterprises pay by far the best salaries to developers with less than a year's experience. Working for a Start-Up may be enticing and will certainly offer lots of personal freedom, but is it worth it financially?

Enterprise is great for personal development and salary, but SMEs are the ultimate combination of good salaries for inexperienced staff, with freedom afforded to grow professionally. Looks like the best first job is with an SME!

WHAT JOB PAYS BEST IN EACH INDUSTRY?

- Mobile Developers in the Entertainment industry can be very high earners.
- Financial Developers score highly across the board.
- Embedded Applications are quite specialist, and thus fetch quite a high salary.
- Game Development salaries still don't offer parity with other forms of application development.

AVERAGE SALARY



It's probably unsurprising that game development doesn't pay that well; people in this industry do it for love, not money!

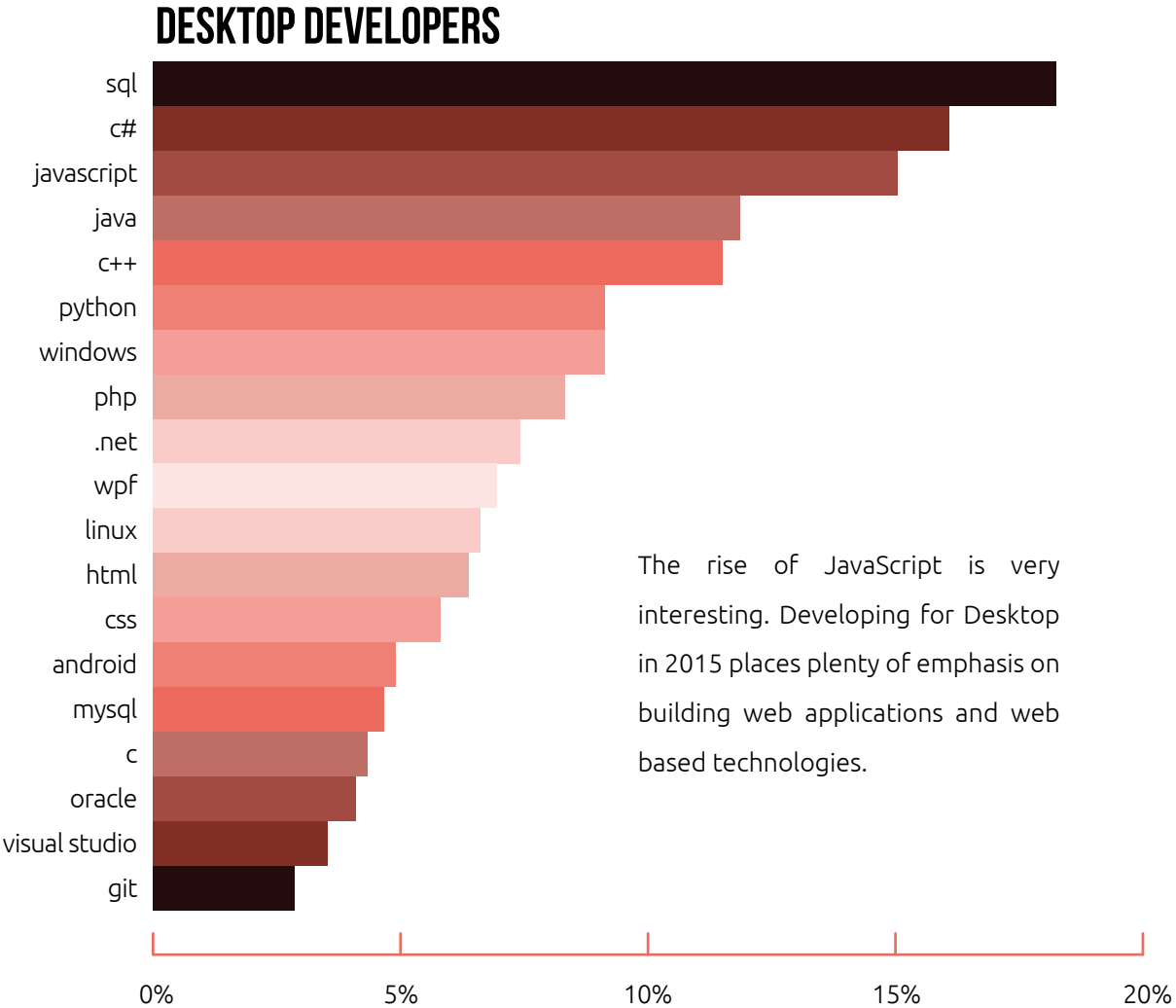
If you're looking to create something exciting and fun, but don't want to sacrifice too much potential salary then why not consider getting involved with Entertainment application development, which offers one of the highest salaries for its speciality.

If you want to develop mobile applications for Android, the most popular of the mobile platforms, then why not develop the essential skills you need with this great learning bundle?

- Learning Java by Building Android Games
- Android Game Programming by Example
- Creating Dynamic UI with Android Fragments
- Android Studio Essentials
- Android NDK Beginner's Guide Second Edition

WHAT TECHNOLOGY ARE DESKTOP DEVELOPERS USING?

- JavaScript is third most popular language for desktop developers, beating Java.
- We see the usual suspects in C, C++ and Java, with 91% of respondents still seeing a future in these languages.



The rise of JavaScript is very interesting. Developing for Desktop in 2015 places plenty of emphasis on building web applications and web based technologies.

Creating tools for the browser is the future, so now is the time to get to grips with JavaScript for application development:

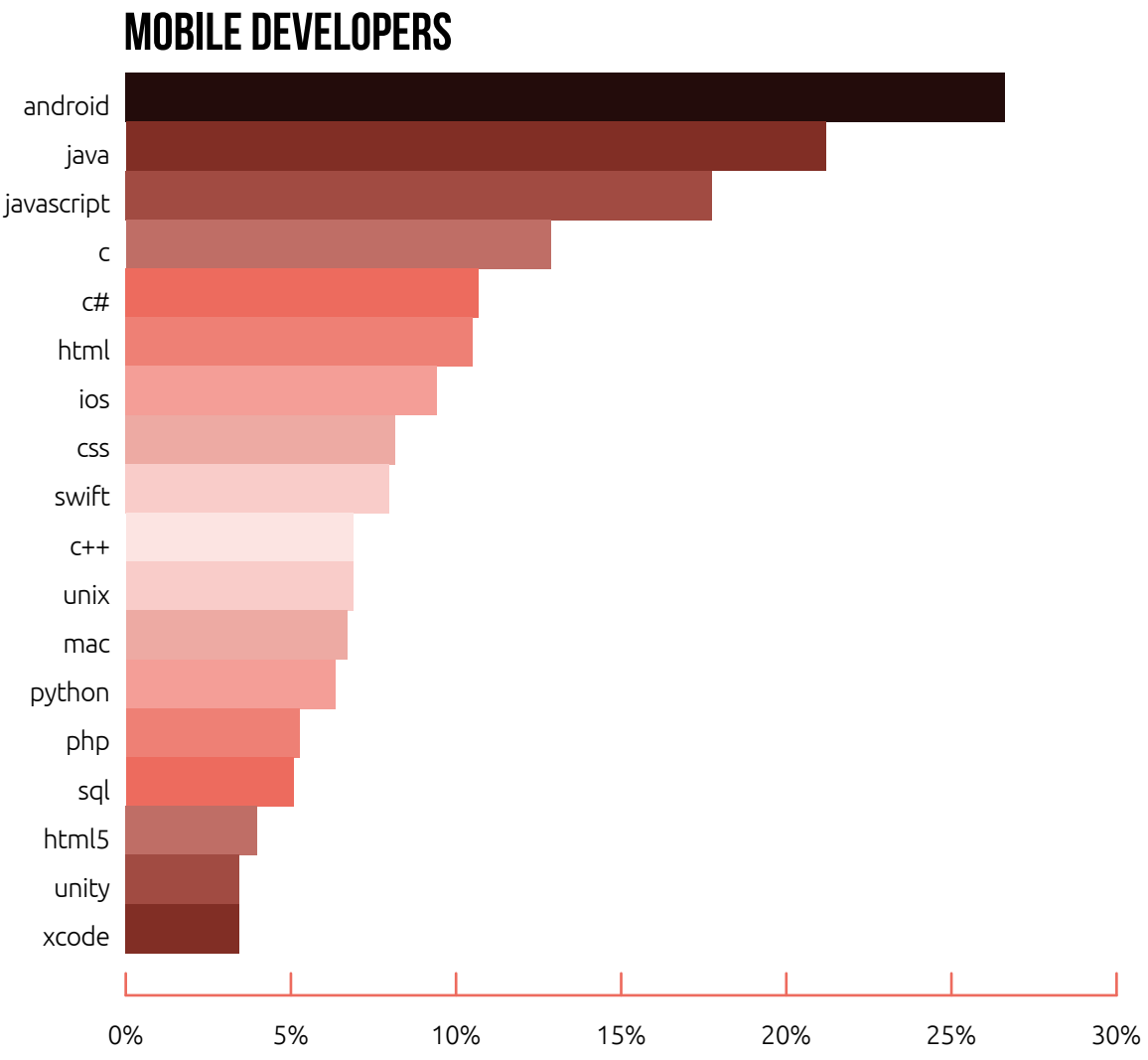
- Node.js Blueprints
- NW.js Essentials
- Getting Started with Meteor.js JavaScript Framework - Second Edition
- Object Oriented JavaScript - Second Edition
- Mastering GIT [Video]

Let's dig deeper into this data and see what technologies those earning the most are using. We've put all our word responses into a tag cloud, with frequency weighted by salary.

The rise of JavaScript is very interesting. Developing for Desktop in 2015 places plenty of emphasis on building web applications and web based technologies. C is still the language of choice for professional desktop developers, but there is also a huge diversity of technology and languages alongside it.

WHAT TECHNOLOGY ARE MOBILE DEVELOPERS USING?

- Android stands out by a clear mile, with almost double the number of developers using it instead of iOS.
- Swift is quickly climbing the rankings, the fifth most popular language for mobile development, just a year after its announcement.
- The appearance of web technologies like JavaScript and HTML suggest growing investment in the skills for cross-platform mobile development.



In the land of mobile development, Android's rule is absolute. Almost twice as many developers say that they build for Android than those who build for iOS.

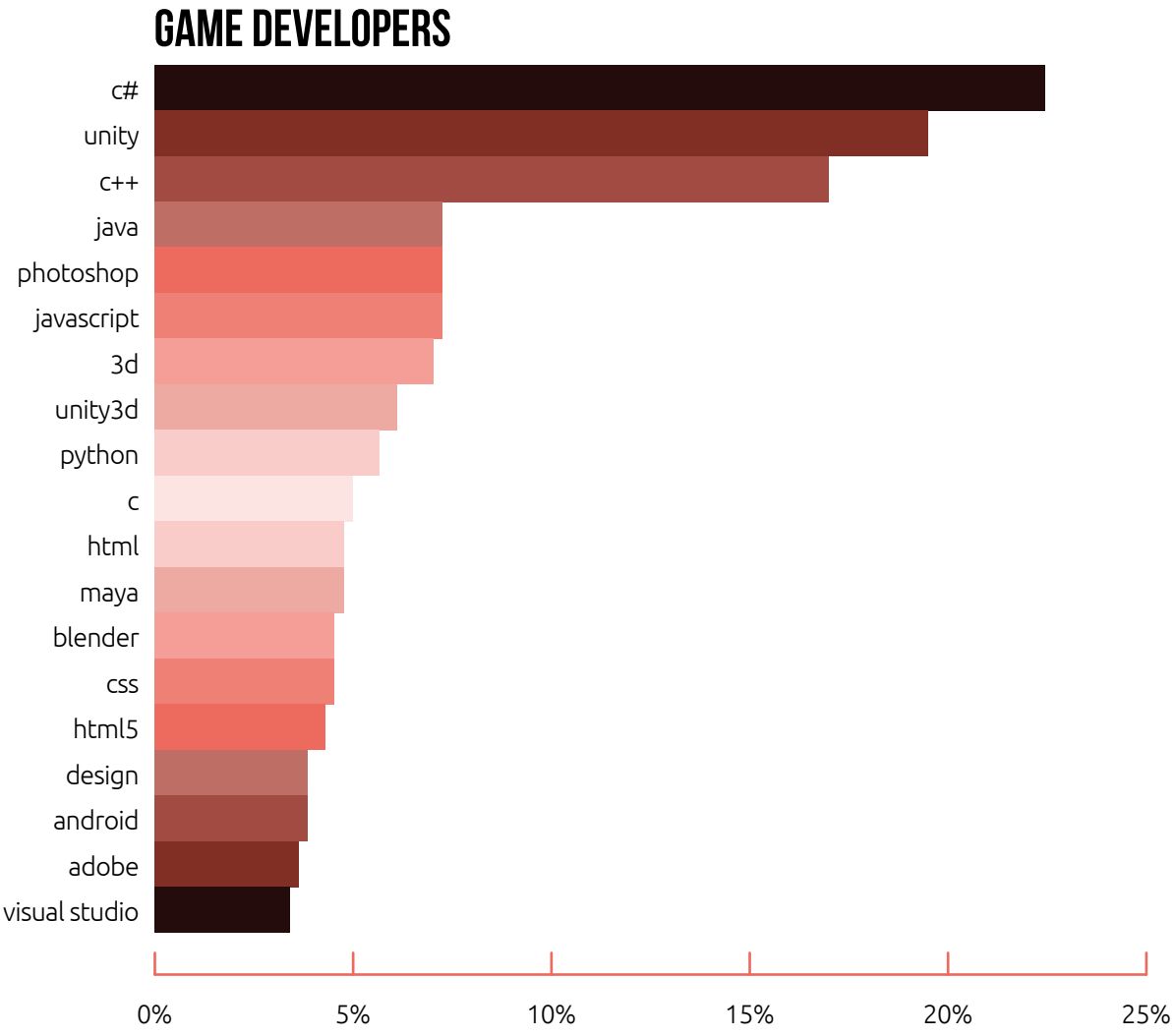
Let's look at this data further and see what technologies those who are earning the most are using. We've put all our word responses into a tag cloud, with frequency weighted by salary.

Again, Android and Java are weighted far above iOS and Swift, which gives us insight into the shape of the mobile market.

There's a big use of web technologies such as AngularJS, JavaScript and HTML suggesting that cross-platform knowledge is important. Xamarin also features as a lucrative skill, allowing C and .NET developers to push their language knowledge cross-platform.

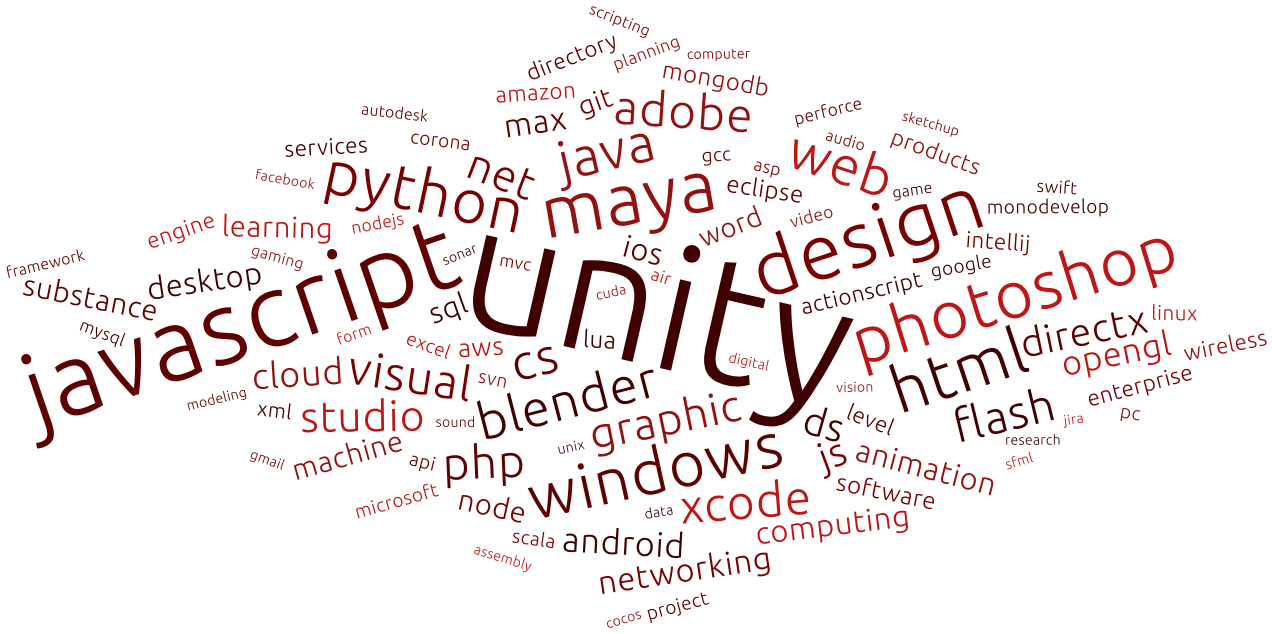
WHAT TECHNOLOGY ARE GAME DEVELOPERS USING?

- From the data it's clear that if you want to make any serious money in game development, you need to learn Unity and Unity-related tech such as C#.
- For a third time, we see web-based tools appear as valuable skills; deployment to the web is a great way to publicize your game to the world!



C# and C++ are the big languages for game development and no wonder. Knowing C++ is essential for building the nuts and bolts of a game, from audio programming to networking.

Let's drill down and see what technologies people earning the most are using. We've put all our word responses into a tag cloud, with frequency weighted by salary.



That's pretty clear! Unity is the standout need-to-know tool for professional game development, dwarfing its biggest rival, Unreal Engine. With its new tech for 2D game development, Unity is a double threat and looks like a mandatory skill for anyone who is serious about making games.

- **Getting Started with Unity 5**
- **Unity Game Development Blueprints**
- **Unity 3D UI Essentials**
- **Learning Unity 2D Game Development by Example**
- **Mastering Unity 2D game development**

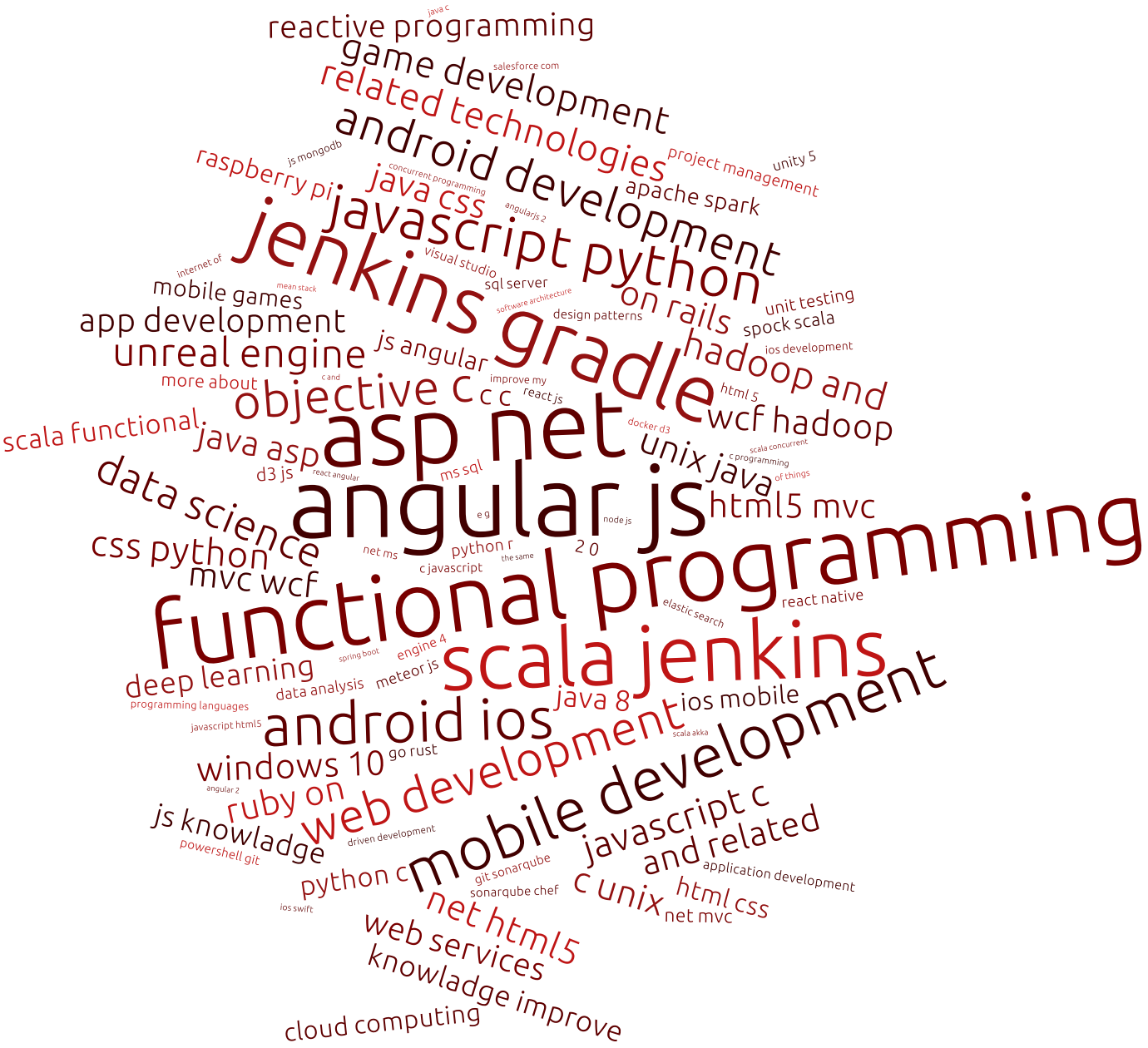
After Unity, we see a great variety of smaller tools, from graphic creation software such as Photoshop and Blender, to interesting occurrences such as OpenCV. Does the rise of AR applications mean that computer vision is a skill to learn?

WHAT DOES THE FUTURE LOOK LIKE?

- Functional Programming is the single biggest area that our respondents are planning to use over the next six months.
- Big data and data science are breaking into the field, with big data being heralded as the future.

WHAT ARE YOU USING IN THE NEXT SIX MONTHS?

We asked developers what technology they were planning on using in the next six months. All the responses were placed in the tag cloud below.



Functional programming looks like the technology of tomorrow (with reactive programming following quickly behind it). If you want to stay on top of your game, learning functional programming might soon become a necessity!

- **Clojure Reactive Programming**
- **Functional Python Programming**
- **Functional Programming in JavaScript**
- **Learning Reactive Programming with Java 8**
- **Clojure Reactive Programming**

Scala is also looking very popular, tied in to the interest in functional programming. The top scoring language, Scala, looks to be next to take programming by storm.

Plenty of terms for mobile development feature too - iOS, Android, Objective C, Swift - suggesting that application developers are dipping their toes into mobile!

Alongside mobile development, we can see evidence of application developers looking to expand their skillset into data science, as terms such as 'deep learning' and 'data science' come to the fore.

WHAT'S THE BIGGEST EMERGING TREND IN YOUR FIELD?

- Big data is the paradigm everyone still has on their mind.
- Cloud computing is maturing and coming of age in application development.
- Alongside functional programming we can see the rise of reactive programming.
- We can soon expect our net-connected kettle – the Internet of Things is on the rise!

This map shows a very cohesive picture of where the world of technology stands right now. Let's take a closer look at some of the break out trends:

- Big data continues to be the new paradigm that everyone is thinking about. Data is an incredibly powerful tool. If used correctly, you can generate real time insights on a macroscopic and microscopic level. The entire world is awash with data, and this trend is only going to continue as more and more devices become connected.

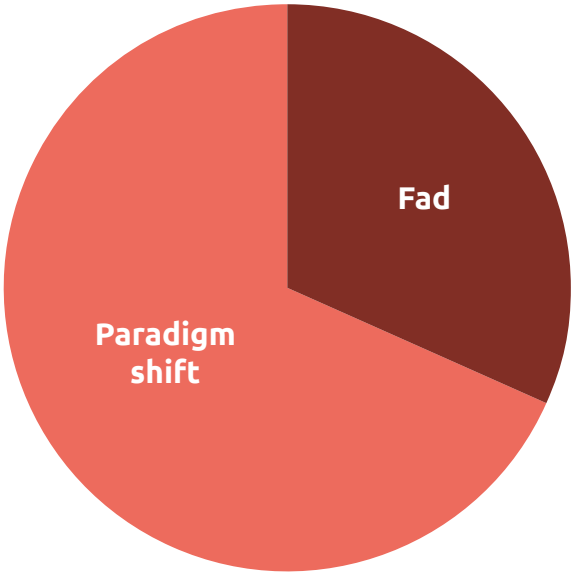
- The Internet of Things is the vehicle that is going to be connecting those devices, allowing data to flow from every corner of the world. The vast tidal wave of new information that this is going to produce is the next big challenge facing the tech world.

- Reactive Programming is one of the new ways that application developers are equipping themselves to deal with the mountains of data the future promises. It's no wonder to see reactive programming alongside functional programming as one of the Next Big Things for creating applications.

- Cloud Computing is maturing as a technology, with more powerful and stable platforms.

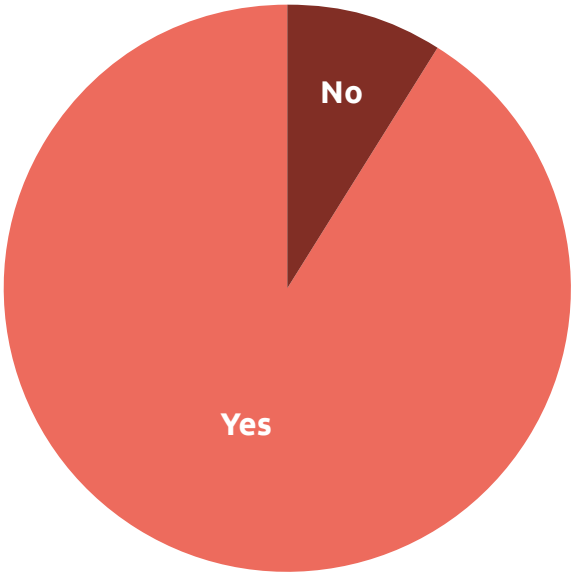
HOT TOPIC ANALYSIS

DO YOU THINK REACTIVE PROGRAMMING IS A PARADIGM SHIFT, OR JUST A FAD?



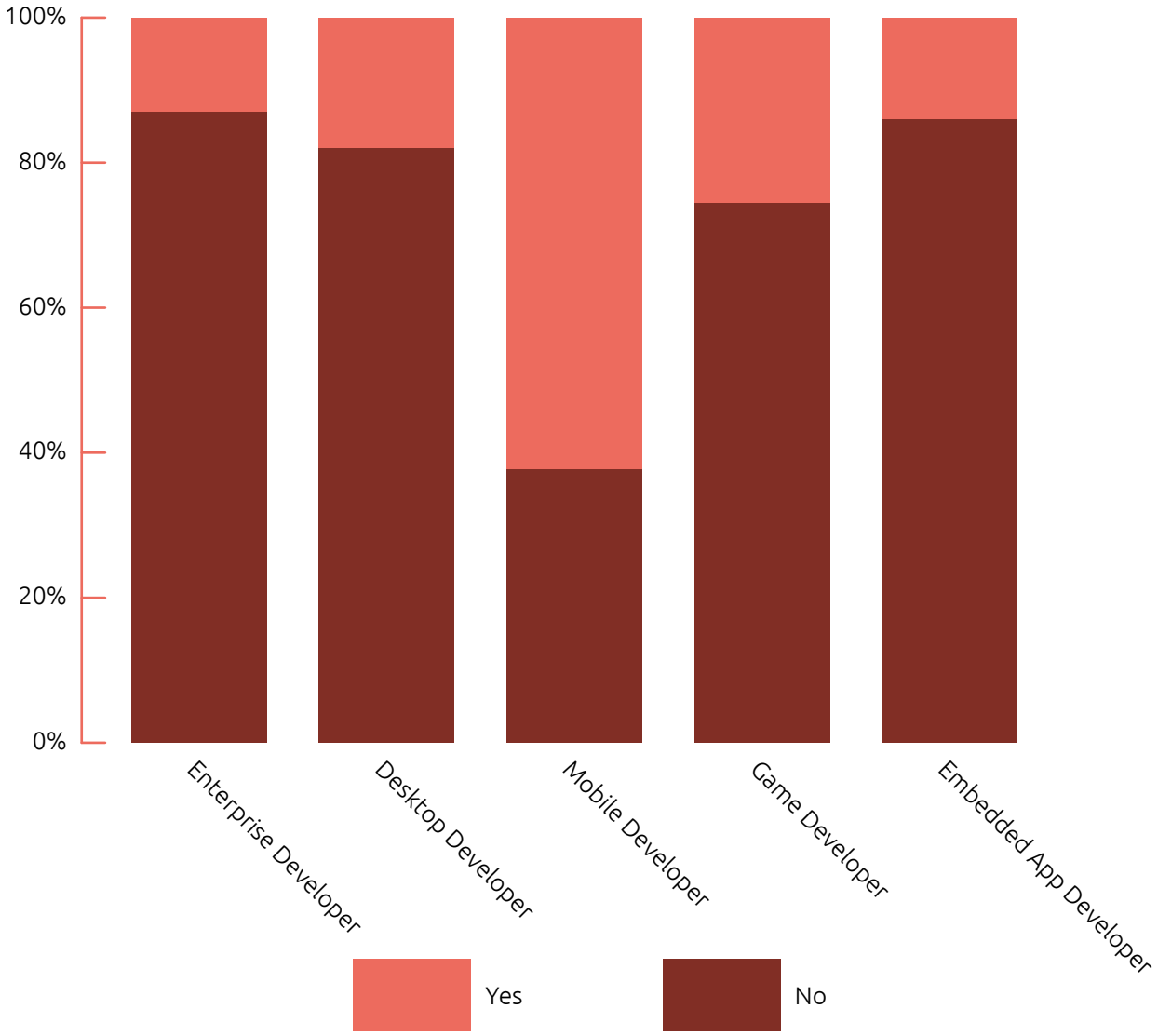
Overwhelmingly, real-world developers think that reactive programming is going to change the way that we think about data flows. This really is the Next Big Thing for programming.

WITH THE ADVENT OF RUST AND GO, DO YOU SEE A FUTURE FOR ESTABLISHED PROGRAMMING LANGUAGES SUCH AS JAVA AND C++?



None of the respondents seem to think that Java and C++ are going to disappear overnight and why should they? Disruption doesn't always mean revolution; sometimes it can be evolution too. Who's to say what the response will be once Rust and Go have really started to get a hold in the industry?

DO YOU PLAN ON USING SWIFT IN PRODUCTION OVER THE NEXT 6 MONTHS?

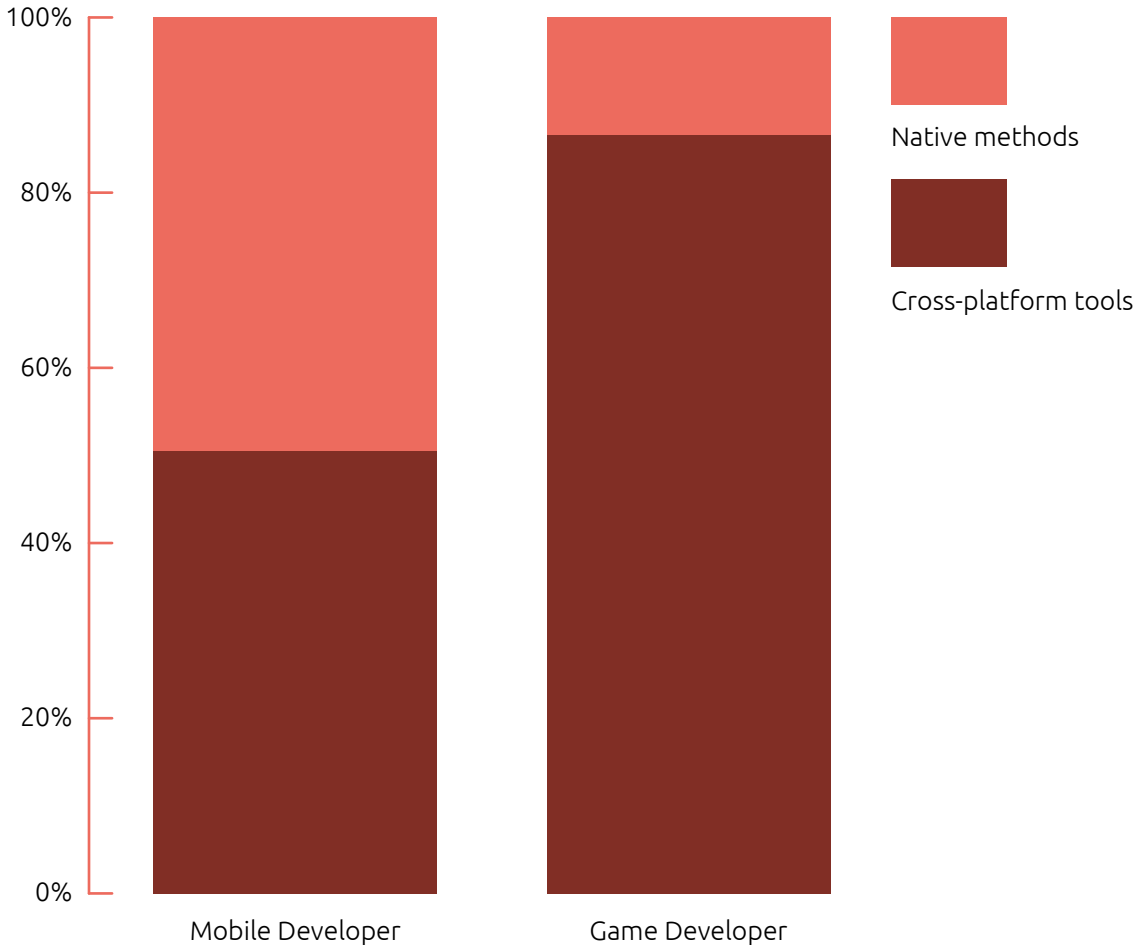


Amazingly, over 60% of mobile developers, and over a third of game developers are planning on taking up Swift, so you probably should too! In other spheres we see a 20% planned pick-up among desktop developers, perhaps building for OSX, or perhaps interested in seeing what Swift can do, now that Apple have declared it Open Source.

DO YOU PLAN ON GENERATING CONTENT FOR THE IWATCH OR ANDROID WEARABLE DEVICES OVER THE NEXT 6 - 12 MONTHS?

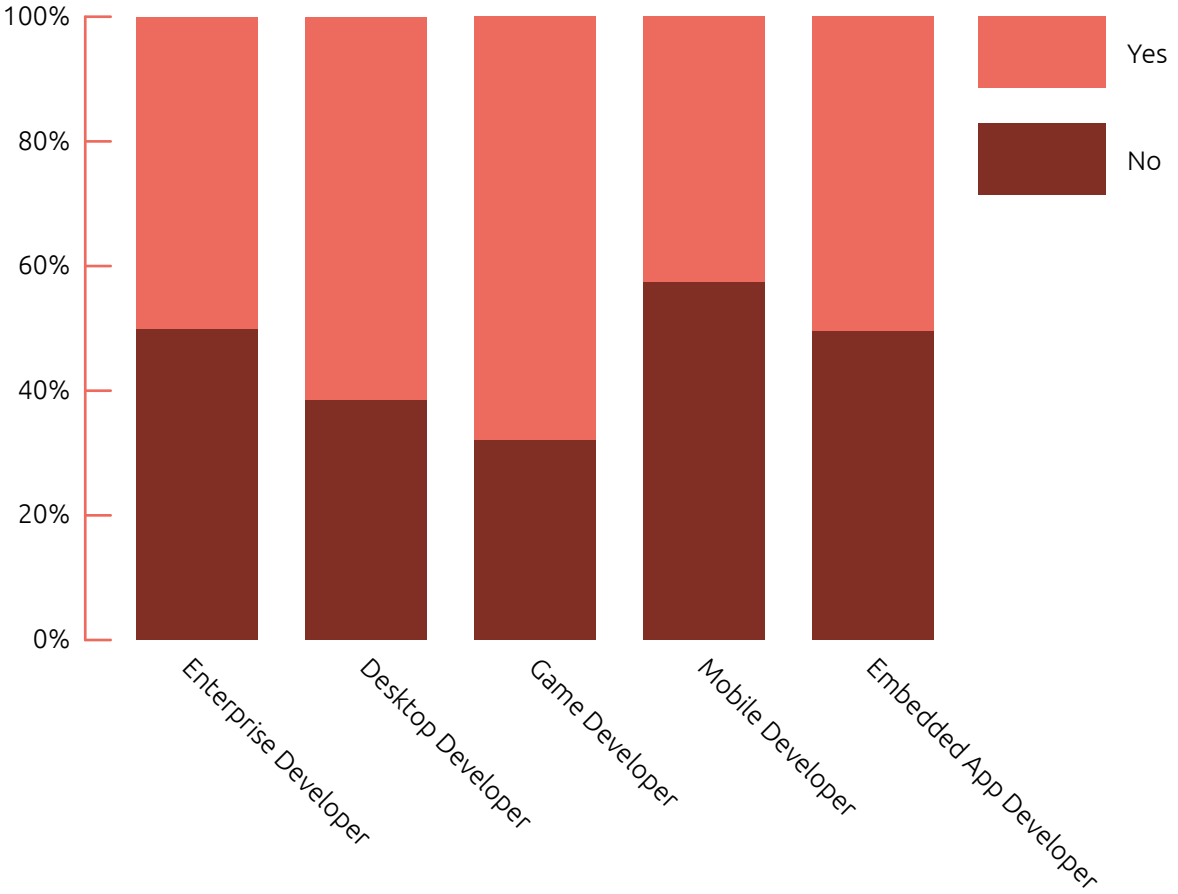
Amazingly, our mobile developers were split exactly 50/50 on whether they were going to build for wearables. Whilst that might not sound impressive at first, think about it this way, that's one in two mobile app developers who has something in mind for the iWatch or an Android wearable. This is virgin territory for developers, with lots of great opportunities on offer to break ground with the Next Big Thing.

ARE YOU MORE LIKELY TO DEVELOP APPLICATIONS AND GAMES USING CROSS-PLATFORM TOOLS, OR USING NATIVE METHODS?



Mobile developers are split down the middle on native versus cross-platform tools, whereas game developers have a clear preference for creating their products cross-platform. There are many potential reasons for this, though perhaps the most likely reason is the different aspects of mobile functionality that the different developers will need to access. Application developers may need to link your phone contacts, your camera, and more. These kinds of tasks are best achieved through native development. In contrast, the type of input required for mobile games is usually pretty minimal, often not much more than touch functionality. When you don't need to dig into the meaty parts of a system, the advantages of cross-platform development just get better!

NOW THAT .NET IS AN OPEN SOURCE FRAMEWORK, ARE YOU MORE LIKELY TO USE IT IN THE FUTURE?



In general, the answer is 'Yes'. People are more prepared to give .NET a shot now that it's gone OS!

WHAT'S NEXT?

- Getting to grips with web technologies, particularly JavaScript is becoming essential for all aspects of application development, whether desktop, mobile, or creating games. Why not grab our specialist JavaScript bundle formulated specially for app developers?
- If you want to stay current, you need to get to grips with functional and reactive approaches to programming. If you're looking to get into these two exciting new areas, our Reactive Functional Programming bundle is a great place to start.
- Professional Game Developers need to know Unity if they want to make serious money from their passion. With the new Unity 5 just having arrived, there's never been a better time to get started with the world's premier game engine.
- Android rules the world of mobile. It's got the masses and the money developing for it today. Learning how to develop for Android, it's a valuable skill, even if you're not directly involved in mobile development, so why not get to grips with our starter bundle?

[PACKT]
PUBLISHING

HELPING IT PROFESSIONALS TO PUT SOFTWARE TO WORK IN NEW WAYS

Founded in 2004 in Birmingham, UK, Packt's mission is to help the world put software to work in new ways, through the delivery of effective learning and information services to IT professionals.

Working towards that vision, we have published over 3000 books and videos so far, providing IT professionals with the actionable knowledge they need to get the job done –whether that's specific learning on an emerging technology or optimizing key skills in more established tools.

As part of our mission, we have also awarded over $1,000,000 through our Open Source Project Royalty scheme, helping numerous projects become household names along the way.

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DATA SCIENCE & BI

SALARY & SKILLS REPORT

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The world of Data Science is rapidly growing, with data becoming increasingly vital to a huge range of organizations. Undoubtedly tied to the much-discussed rise of 'Big Data' over the past decade, data-oriented roles are today some of the most prominent technical roles in the economy.

This report, focusing on the data science respondents to Packt's Skill Up survey explores where data science is most valuable, what tools are being used, and what the trends and challenges will be in the future.

- Data science is immensely valuable to SMEs evidenced by their investment in young talent.
- Finance is still a lucrative sector for data science.
- R and Python are still neck and neck as the key data science languages.
- Distributed Computing and machine learning are still on the ascendancy.
- IOT is one of the hottest trends for data scientists that promises to bring new challenges and opportunities.
- Excel will never die!

The need to answer these questions led us to look at the community as a whole, and so we decided to launch our Skill Up campaign.

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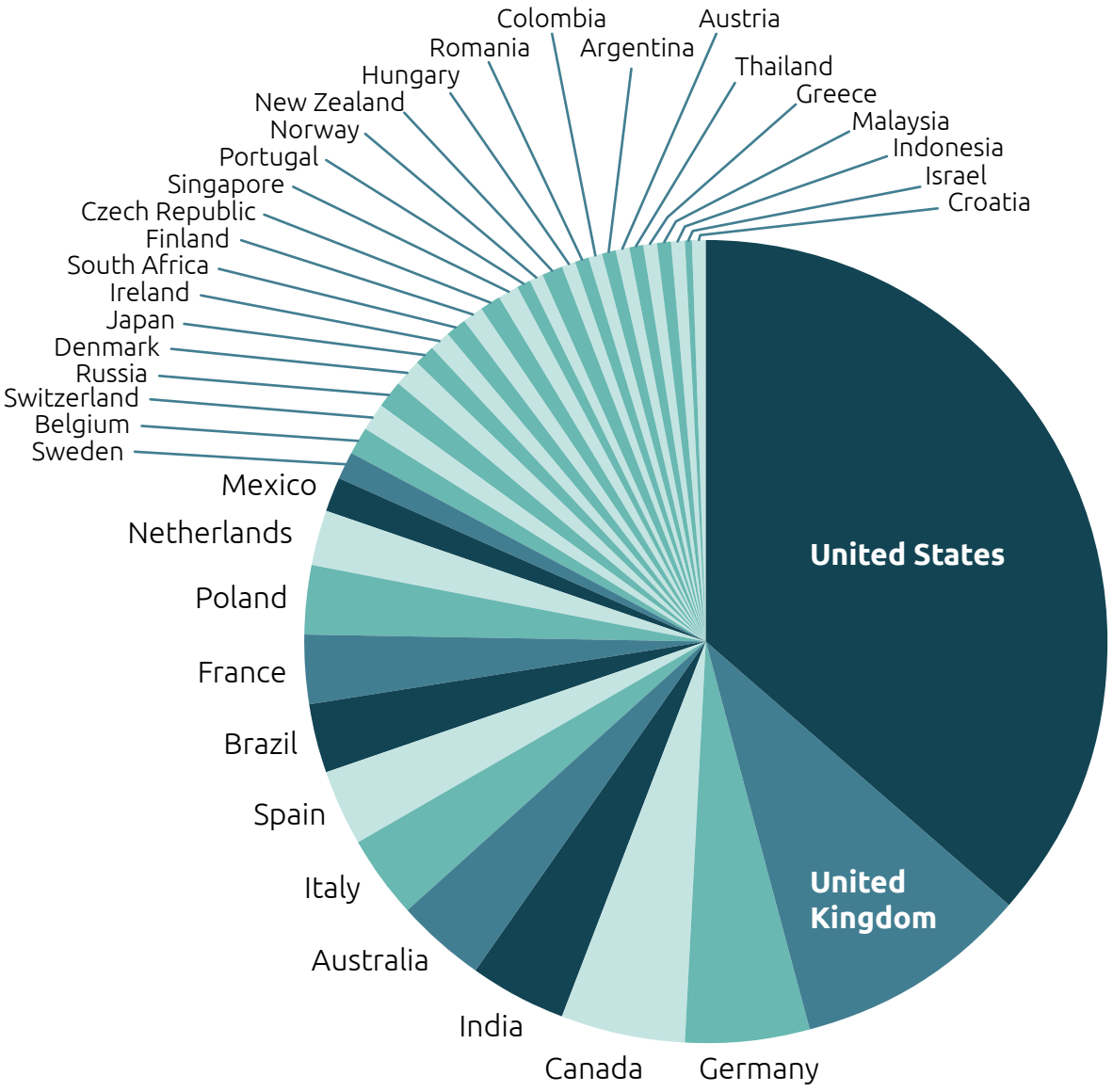
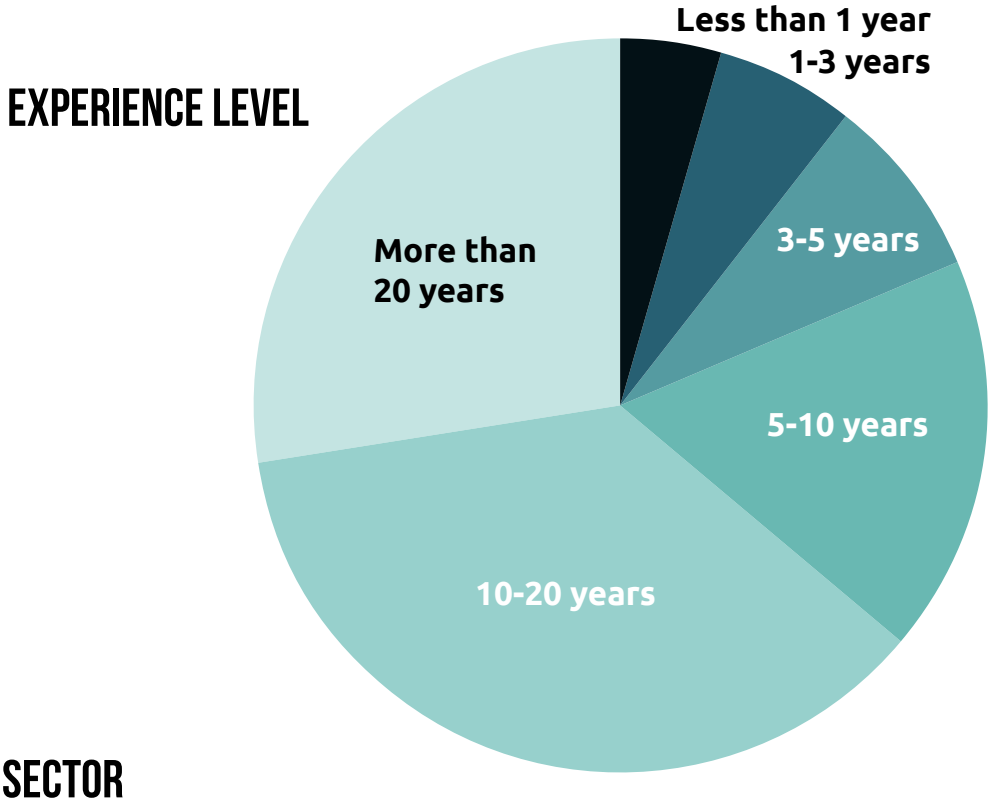
Let's look at the results in more detail.

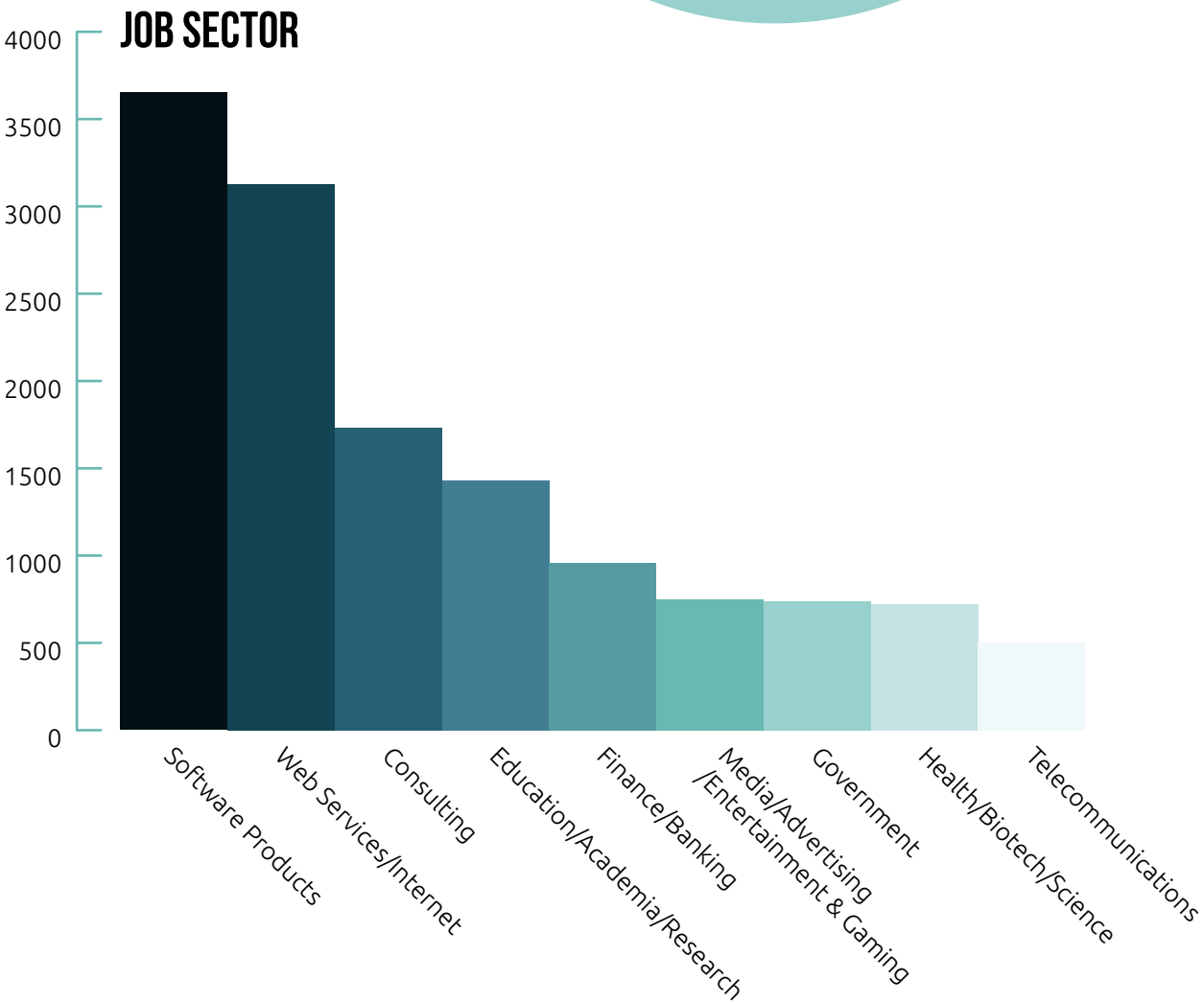
RESPONDENTS



RESPONDENTS BY COUNTRY

The Data Science stream, from which the data in this report is drawn, received over 3,800 responses from individuals with a wide range of experience levels, working in a diverse set of industries.



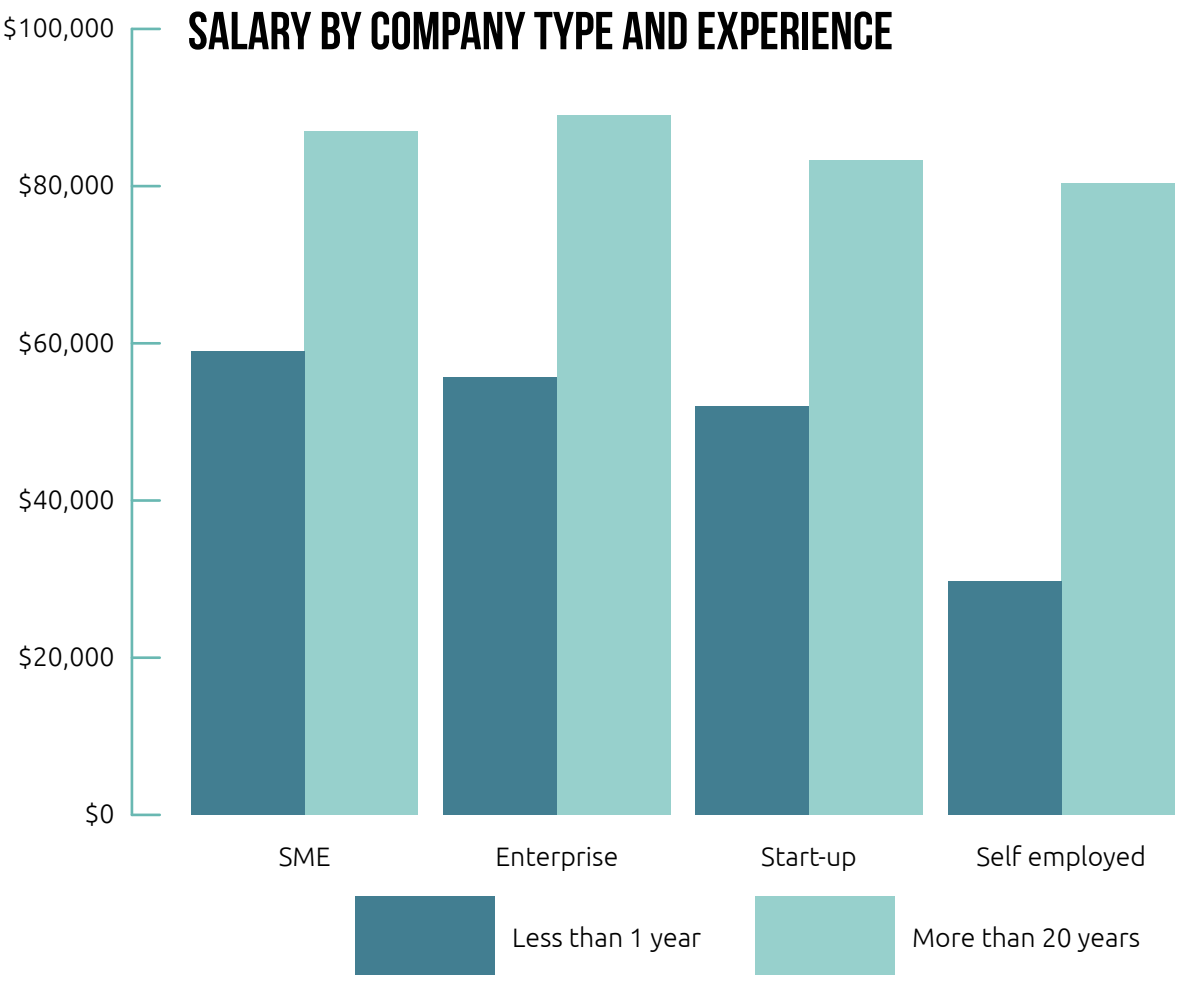


WHICH INDUSTRIES ARE BEST FOR DATA JOBS – AND WHICH ROLES ARE MOST VALUABLE?

There's a consensus that data-oriented roles are some of the most valuable around, especially in industries where data is so vital (there are very few industries where you could say it isn't). But there are trends that indicate where it's having the biggest impact, and what's going to become more and more important for anyone working in data.

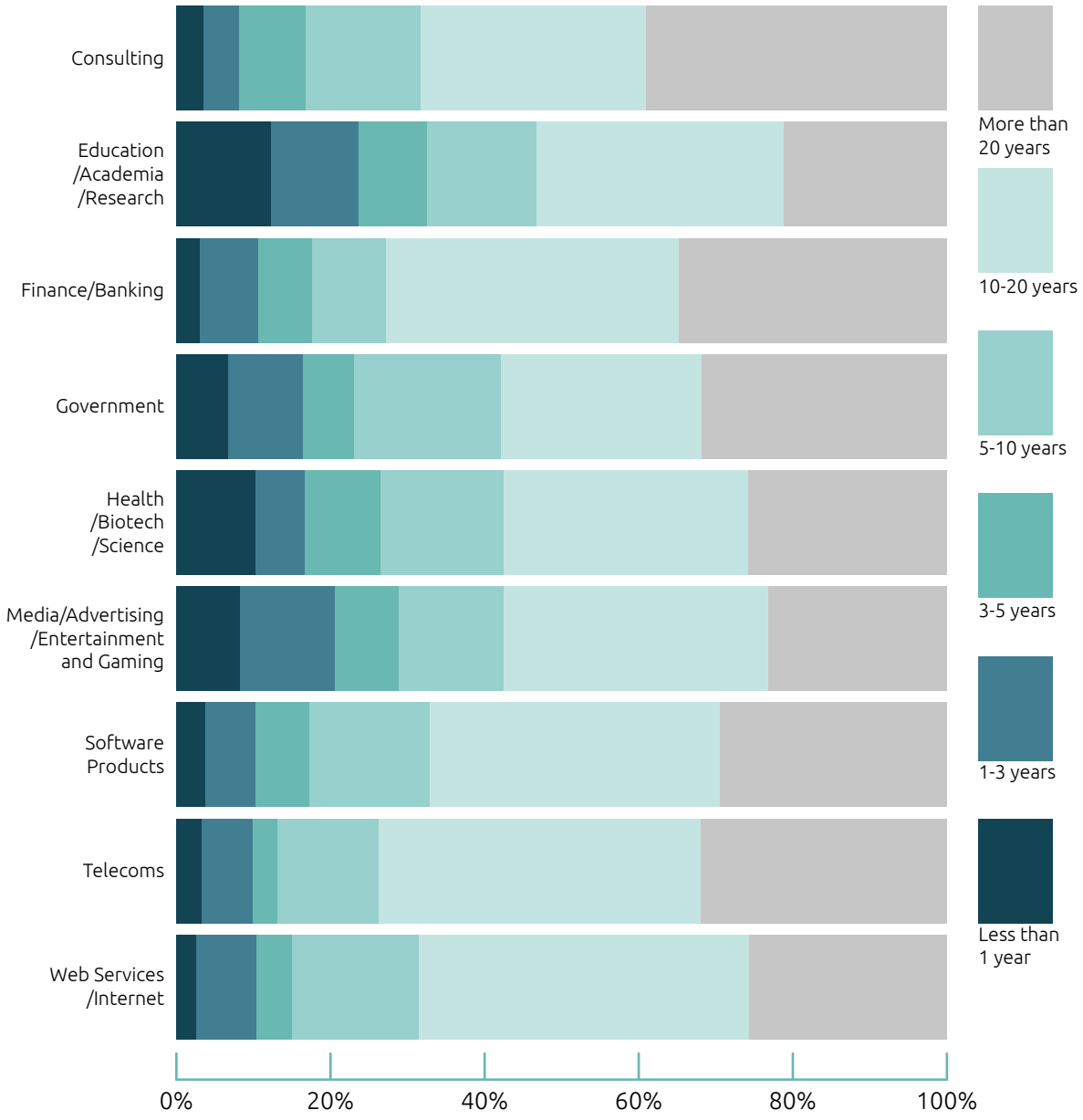
- SMEs pay inexperienced people the best.
- In terms of industries, Finance still offers the best pay for inexperienced employees.
- Data Architect is one of the most important roles in dynamic and fast-paced industries such as Media and Entertainment. This proves that the ability to build and implement business critical solutions is essential.

Our research shows that SMEs are a great place for inexperienced data scientists and analysts to begin their careers, offering a higher starting salary than Enterprise organizations. Even those working for start-ups earn only slightly less than Enterprise. With the opportunities available in small, rapid growth organizations, Start-ups are a great option for anyone ambitious and eager to prove themselves!



INDUSTRY BREAKDOWN

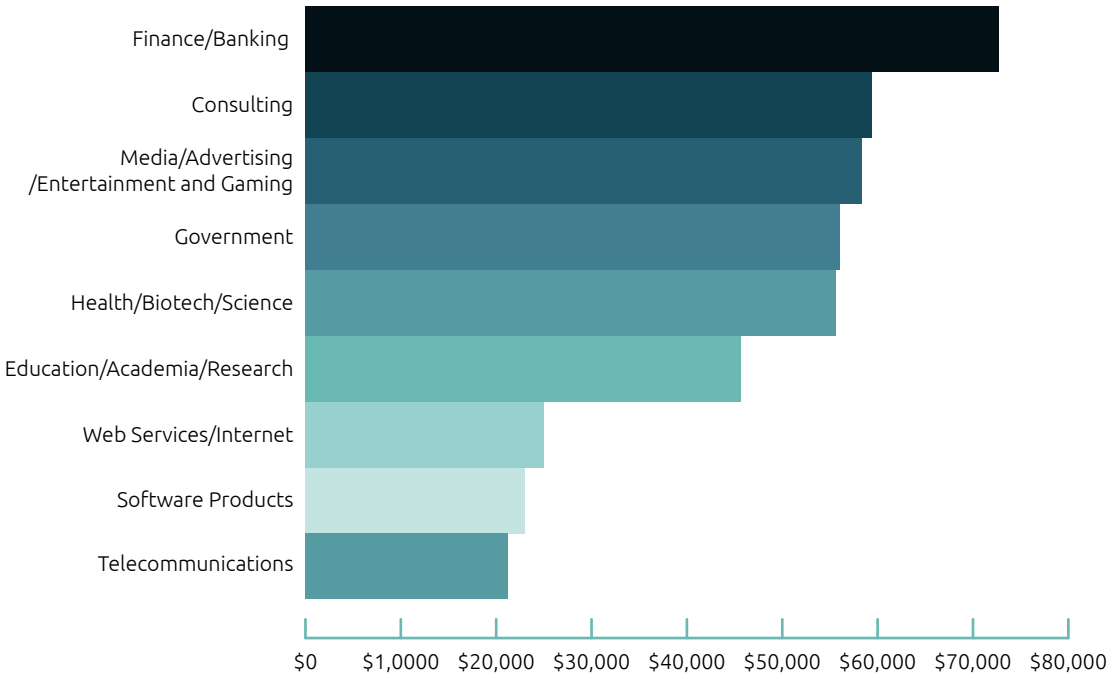
Our research also investigated how data science is faring in each sector. The responses provided a good indication of where data science is most critical.



The largest number of respondents with more than 20 years experience are working in consulting. Moreover, the commonality of this suggests that external expertise is something that is very much in demand.

Those respondents with least experience are predominantly working in Education/Academia and Research. However, as the graph overleaf shows, it does not appear to be one of the best paid industries.

WELL PAID INDUSTRIES FOR LESS EXPERIENCED PEOPLE



Finance and Banking comes out as the best paid industry according to our data. With the rise of algorithmic trading, and Big Data in general playing a large part in just about every component of Finance, there are huge opportunities for data fluent people to command high salaries, even without a great deal of experience.

Want to get to grips with quantitative finance? Pick up this bundle today.

- Mastering R for Quantitative Finance
- Introduction to R for Quantitative Finance
- Python for Finance
- Mastering Python for Finance
- Advanced Quantitative Finance with C++

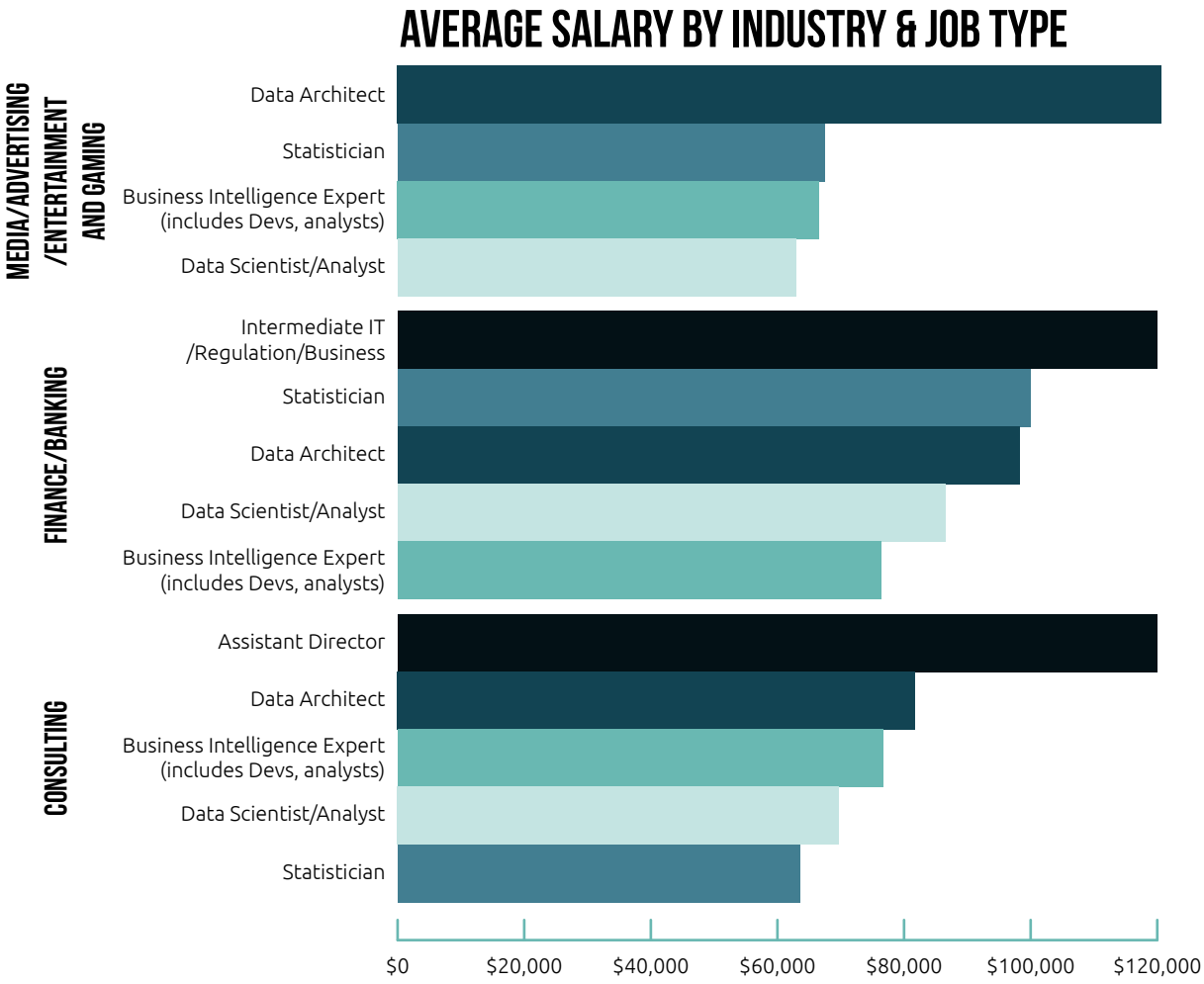
Media / Advertising / Entertainment and Gaming, while certainly not as lucrative as the Financial sector, appears to be a sector offering a substantial salary to inexperienced people. If we consider the fact that this sector, taken generally, is very competitive for inexperienced people and known for low salaries, the data provides a clear indication that these industries are willing to invest in inexperienced people with technical and numerical skills.

This is an indication that these industries are relying on data-driven strategies to remain competitive in tough areas of the economy. While they may lack the funds and cashflow to invest in established data professionals, inexperienced people with the right skills might well fill this role perfectly, without commanding such high salaries.

CAREER DEVELOPMENT AND DATA-ORIENTED ROLES

We've seen indicators of what's best for inexperienced data professionals, but what about career development?

We also wanted to see how the different job types fare in different industries. The graph below shows which specific roles command the highest salaries, and in which industry these roles are most valuable.



- Data Architect is one of the most important roles within Media/ Advertising/Entertainment and Gaming, commanding a higher salary in other areas.
- Comparing the roles of Data Architect to Statistician, we can infer some key differences about how data science and data-driven strategies are playing out between industries. In Finance, the statistician earns slightly more than the data architect whilst in the Media category, the Data Architect earns significantly more.
- In Media and Entertainment, where agility and organizational change is essential for rapid responses to change, there is a high value placed on someone who is able to develop a solution, such as a Data Architect. Whereas, in Finance these architectures are already in place.

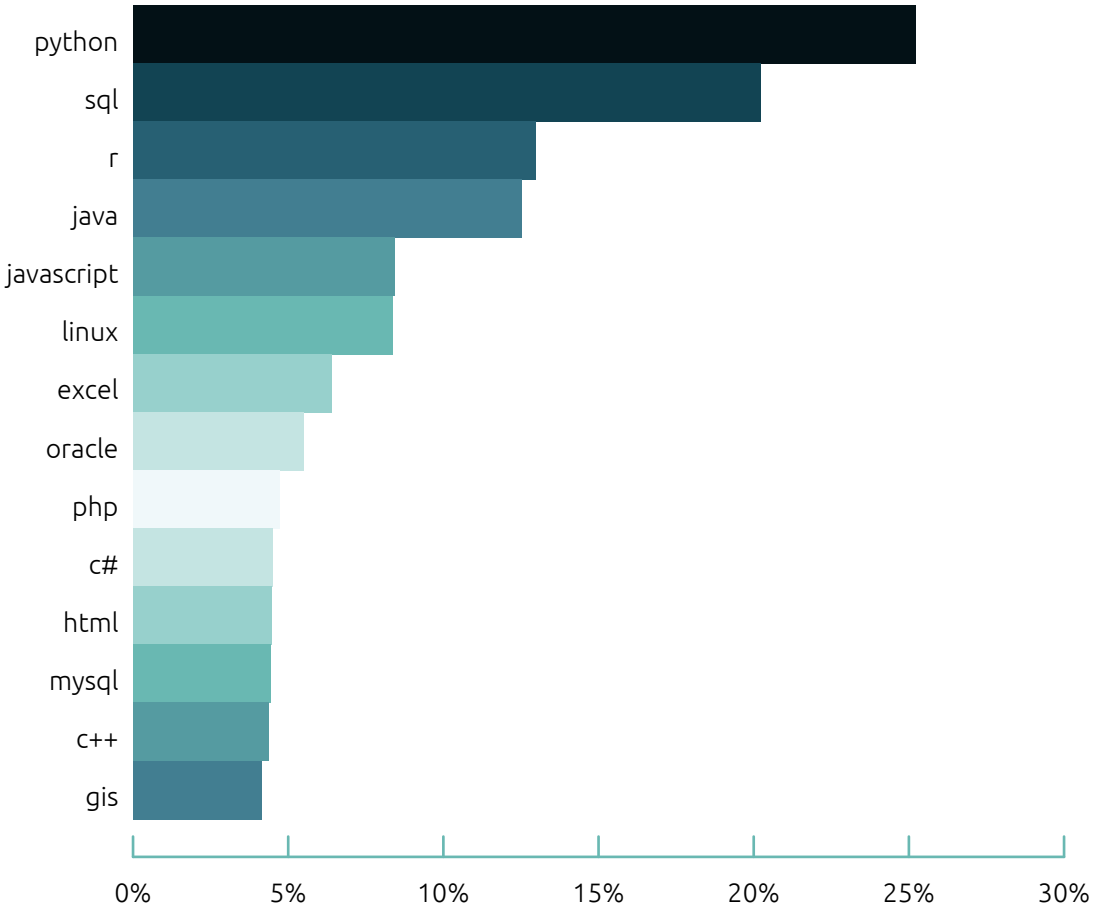
TECHNOLOGY USAGE ANALYSIS

- More than 25% of respondents use Python on a daily basis, but almost the same number use R.
- Distributed computing and machine learning tools are becoming more and more important.
- Augmented Reality and the Internet of Things are poised to change how we think about data.

The last two points spell out the next 5 years in data. The volume of data available from all sources will only continue to grow exponentially. The technology to deal with that data is still being developed, so don't let yourself get left behind!

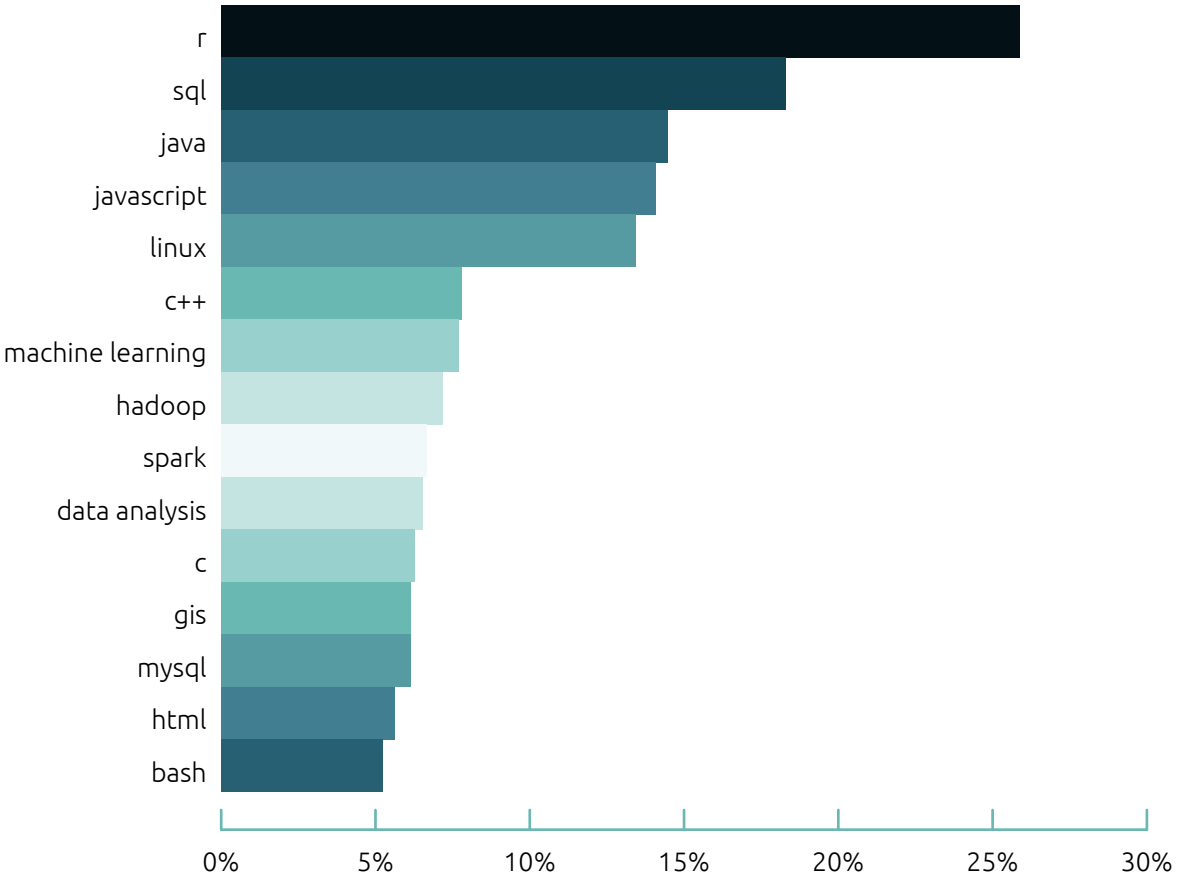
WHAT EXACTLY ARE PEOPLE USING?

We asked what tools people use on a daily basis, and here's what they said:



Python is definitely top dog when it comes to data. Its versatility and wealth of easy to use third-party libraries for everything from machine learning to web scraping, combined with its low barrier to entry, make it the ideal choice.

WHAT ELSE ARE DATA PYTHONISTAS USING ON A DAILY BASIS?



A large number of respondents are using Python and R, Python and Java, or Python and C++.

Get to grips with both Python and R to broaden your fluency and become a more flexible data scientist:

- Practical Data Science Cookbook
- R Data Analysis Cookbook
- Python Data Analysis
- R for Data Science
- Python Data Science Essentials

TECH STACKS

To get a better idea of what people are commonly using together, let's do some clustering. We put all the responses into a graph database, and ran a clustering algorithm across the techs people use every day, and from this we've identified some coherent clusters of people based on their stack:

1. DATA VISUALIZERS

These are people working at the design end of the data science spectrum. As you can see from the cluster of tools below, they have as much in common with a front end web developer as any of our groups. JavaScript comes top here – unsurprising when you consider how much it dominates web development today – and other design tools and plugins such as CSS, HTML5 and jQuery serve to underline its dominance.

The very presence of this group of tools in our data emphasises the importance of communicating insight via the web, and highlights just how important design is when trying to understand and interpret data.

1. JAVASCRIPT
2. HTML
3. CSS
4. PHP
5. HTML5
6. JQUERY
7. JAVA
8. XML

2. PROGRAMMATIC DATA WRANGLERS

This group of tools are used by those people that squeeze insight out of data. They are primarily responsible for mining, cleaning and manipulating data very quickly, in order to answer specific questions about everything from customer behaviour to financial planning.

Python here comes out as the most important tool – perhaps unsurprising given how easy it is to prototype and its much-vaunted flexibility.

The presence of pandas serves to underline Python's dominance – indeed, it might consolidate it precisely because of the way in which pandas improve Python's data analysis capabilities.

But it's also interesting to see C++ here – while Python offers flexibility and ease, the impressive speed that C++ offers is still unrivalled.

1. PYTHON
2. C++
3. LINUX
4. BASH
5. PANDAS
6. MATLAB
7. MACHINE LEARNING
8. POSTGRESQL

3. BIG DATA EXPERTS

This cluster of tools is used by Big Data specialists, interested in scalability and robustness.

Hadoop here dominates the Big Data world – however, Scala and Spark are also growing in prominence, as their presence in this cluster indicates. As demand grows for faster processing (and by extension real-time analytics), it's likely that we'll see more from them.

It's also interesting to see web tools such as JavaScript and Spring included here. As with the first cluster, this indicates the need to communicate effectively and quickly through web based applications.

1. JAVA
2. HADOOP
3. MYSQL
4. JAVASCRIPT
5. SCALA
6. SPRING
7. SPARK
8. MAVEN

4. DATA ARCHITECTS

This group of tools reflects the need to organize and communicate data insights in effective and intelligent ways – the main challenge of a Data Architect. Clearly, Enterprise-Ready tools dominate this cluster, indicating that Microsoft and Oracle are still regarded as go-to brands when it comes to these business-critical tools.

1. SQL
2. MS
3. ORACLE
4. SERVER
5. SSIS
6. SSAS
7. DATABASE
8. SSRS

This provides a useful insight into how the world of data breaks down, and how different roles appear to be built around 'ecosystems' of tools. One of the interesting questions that comes out of this is how this might change over the coming years. Is it possible that these clusters will become more fluid?

WHAT COMES NEXT?

We asked people what tools they were planning on learning over the next 6 months. We wanted to know what's hot, and what people in the know (those earning the money) are using, to help you decide in which area you'd like to enhance your skills, or learn new ones.

In the tag cloud below word frequencies are weighted by salary. So what are people looking to learn?

There are a few key points our research suggests here:

- Spark and Hadoop are well represented, suggesting the growth of cluster computing.
- Web Based technologies are also appearing here indicating people are seeing a value in sharing data analysis on the web.
- NoSQL databases are going to keep rising in the data world.

WHAT TRENDS ARE EMERGING?

We asked respondents what they think is the most important trend emerging in their field in the next 12 months:

There are some clear messages here:

- Machine learning is going to become one of the focal points for everyone working in data, driven by a demand for predictive insights and statistical analysis in a range of sectors and industries.
- Augmented Reality and Internet of Things are going to be key challenges for data scientists over the next few years.
- The prominence of mobile in the tag cloud suggests an increased emphasis on mobile analytics as users move further away from desktop.
- Distributed Computing (both on clusters and on the Cloud) is going to change the way we even think about data, suggesting increasing anxiety about how to manage resources for Big Data projects. This is possibly symptomatic of the two outcomes above. As IoT and mobile become more dominant, managing larger datasets is going to become a greater challenge.

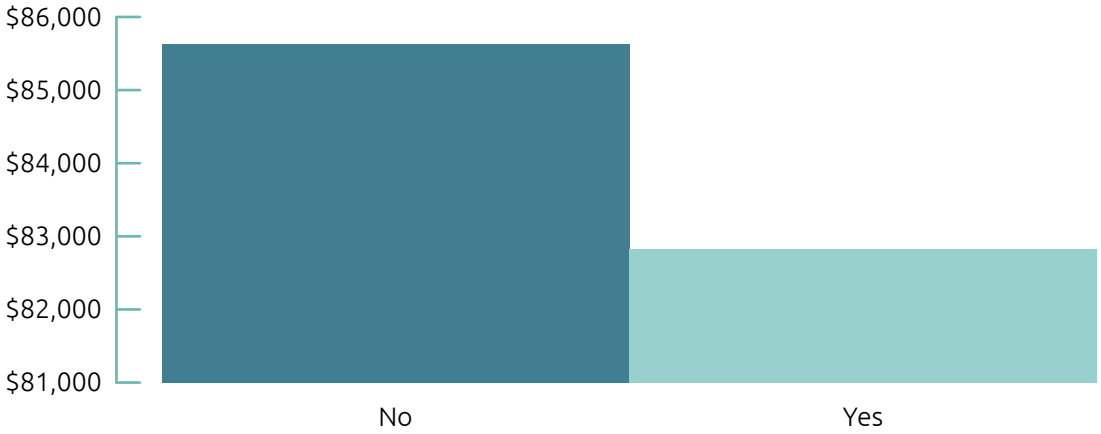
If you're involved with a Big Data project, you're going to need Machine Learning. Pick up this bundle and start exploring machine learning and predictive analytics today.

- Machine Learning with Spark
- Scala for Machine Learning
- Machine Learning with R
- Machine Learning with R Cookbook
- Building Machine Learning Systems with Python - Second Edition

HOT TOPICS

To complete our survey, we asked respondents some simple questions about hot topics, trends and challenges in the data.

DO YOU THINK JULIA WILL REPLACE R AND PYTHON AS THE DATA SCIENCE LANGUAGE OF CHOICE IN THE NEXT 12 MONTHS?

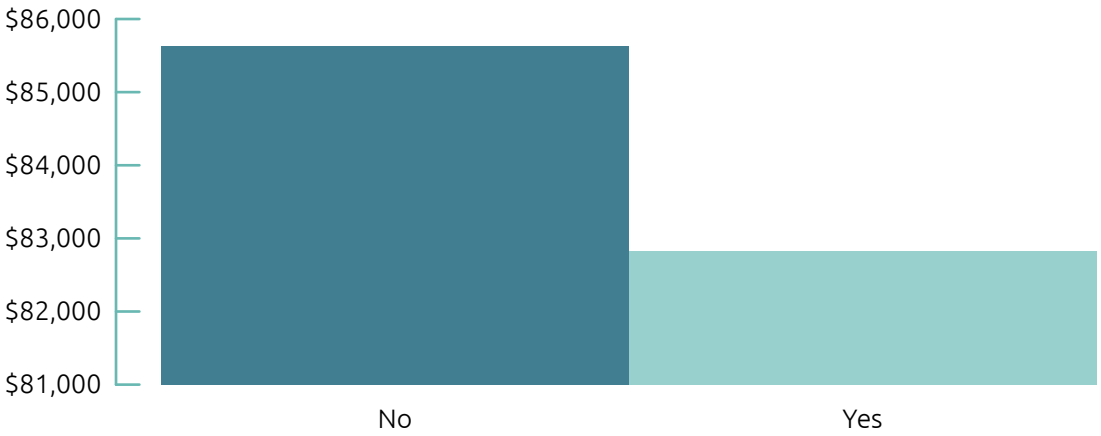


According to the highest earning respondents, Julia is on the ascent. It's easy to see why as it is designed specifically for technical computing, and boasting interesting features such as multiple dispatch, useful libraries for graphing, and impressive JIT compiler benchmarks. Julia is one to watch!

Stay ahead of the trend and start learning Julia with this essential selection of Julia books.

- Getting started with Julia Programming Language
- Mastering Julia
- Getting Started with LLVM Core Libraries
- Python High Performance Programming
- R High Performance Programming

DO YOU THINK APACHE SPARK IS LIKELY TO REPLACE HADOOP IN THE NEXT 12 MONTHS?



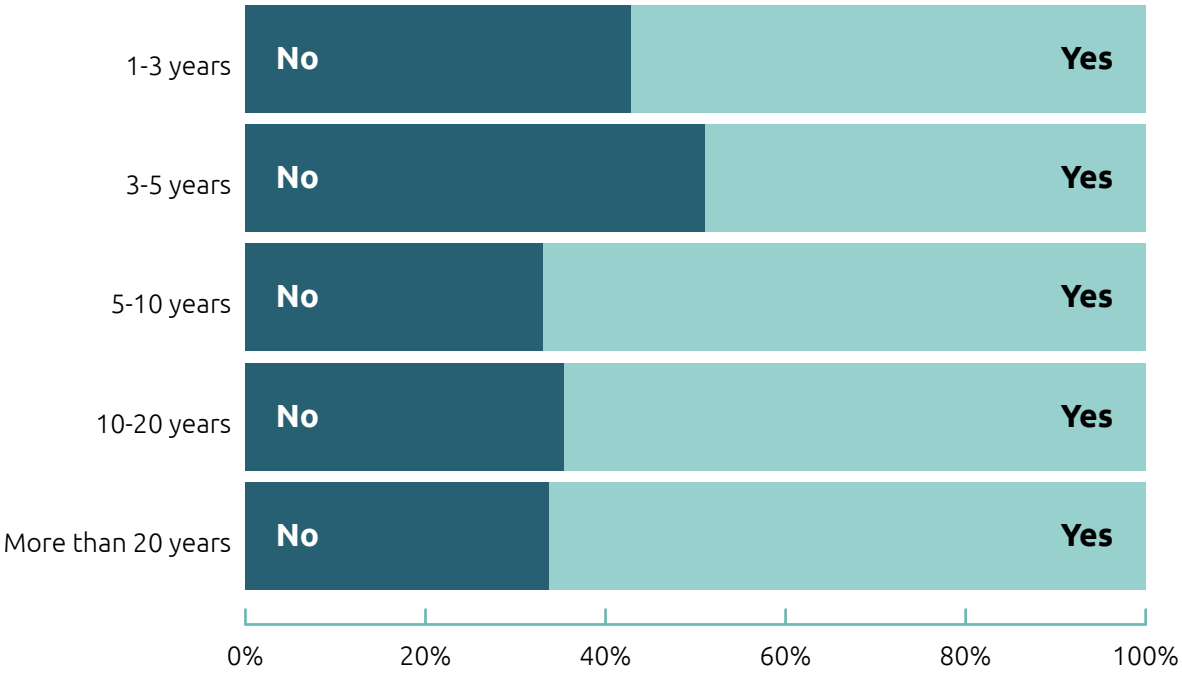
Our survey says you're safe for now!

However, if you're not already on the Hadoop train, there's never been a better time to get on it…

- Learning Hadoop 2
- Mastering Hadoop
- Big Data Analytics with R and Hadoop
- Fast Data Processing with Spark - Second Edition
- Apache Mesos Essentials

IS THE LINE BETWEEN DATA ANALYSIS AND DATA RETRIEVAL BEING BLURRED?

Across the board, this was contentious.



- 64% agree that it is.

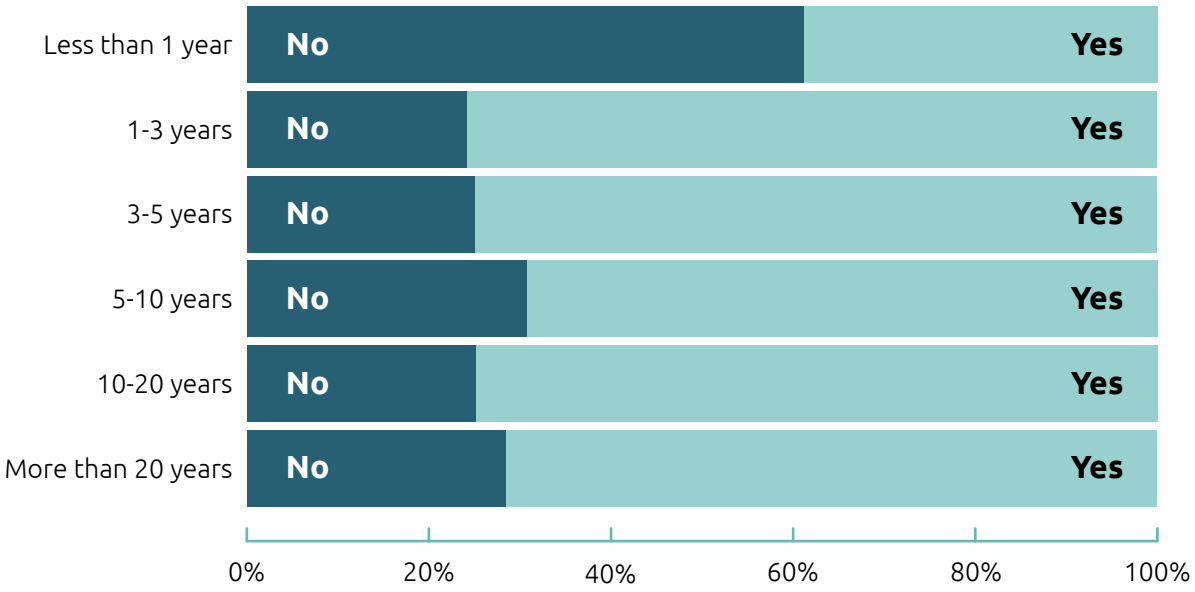
This suggests tools such as BigQuery could become more prominent. It's certainly a tool to watch over the next 12 months.

As Big Data becomes ubiquitous, the aim of the game is no longer to simply have the most effective strategy, but also the most efficient and fast.

Learn how to master the art of data analysis and retrieval with this bundle of popular books:

- Clean Data
- Practical Data Analysis
- Mastering Predictive Analytics with R
- Learning Data Mining with R
- Learning Pandas

IS YOUR COMPANY PLANNING TO IMPLEMENT A BIG DATA PROJECT OVER THE NEXT 12 MONTHS?

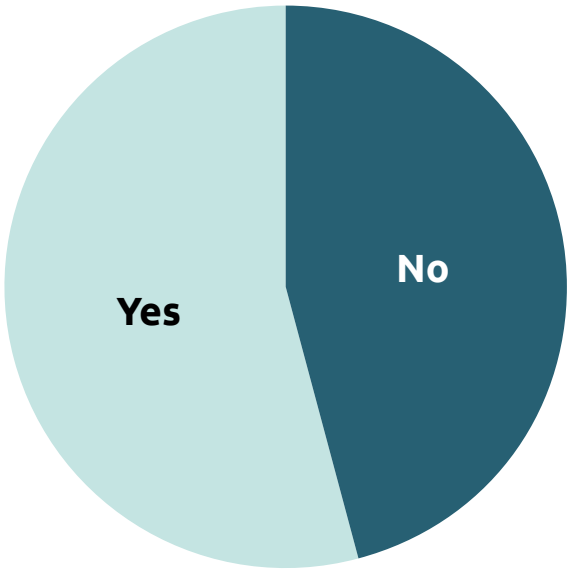


It appears that most respondents are working in organizations looking to implement Big Data projects. The significant anomaly to that are those with very little experience. The reasons for this aren't immediately obvious, but there are a number of possible explanations.

It could be that those with very little experience simply aren't privy to organizational strategy and decision-making. Conversely, it could be that those people who are just starting out have been employed precisely because a Big Data project has been implemented.

AND FINALLY...

DOES EXCEL STILL HOLD A PLACE IN YOUR HEART?



Excel is eternal, Excel 2013 is awesome…all of you know it deep down!

SUMMARY

It may be a truism, but it's clear, and perhaps it has been for years, that Data Science and Big Data are not simply trends, but are instead symptomatic of a wider social, cultural and economic change.

It's time we stopped talking about the 'Big Data revolution' or how 'data scientist' is the 'sexiest job of the twenty-first century', and instead look at the different ways data is being used in different areas. For SMEs, data is crucial for making companies more responsive and open to changes in the market. The prominence of machine learning underlines this further, making it clear that there is a real onus on delivering rapid insight and fast! For larger organizations there is a drive towards creating faster Big Data solutions. The apparent rise of distributed and cluster computing is evidence of this, as data scientists and analysts look for new ways to put tools such as Hadoop and Spark to work.

But even more interesting is how our understanding of data looks set to change, thanks to emerging trends such as the Internet of Things and Augmented Reality. It's possible that IOT will become the buzzword to replace Big Data. How Data Scientists, analysts and architects tackle it day to day isn't clear yet, but it will almost certainly be a challenge that will offer exciting opportunities for data literate people everywhere.

What you should be doing if you're a data scientist:

- Broadening the range of languages you know is essential. It will help you become more flexible when working on a range of different projects and also provides you with more solutions. If you know R, why not learn Python?
- You need to get to grips with Machine Learning. If you want to get started or investigate it further, grab our Machine Learning bundle!
- If you're just starting your career, you could do a lot worse than working in Finance or for an SME. You might command a higher salary working for an established enterprise organization, but the difference is likely to be small with more opportunities and responsibility at an SME.
- If you're interested in working in popular industries such as Media, work towards becoming a data architect, and learn how to develop and implement large-scale data solutions that can deliver benefits across an organization.
- Getting to grips with Big Data tools such as Hadoop and Spark will be valuable, but learning how to use them in the context of distributed networks will be even more valuable as resources become stretched.
- Pay attention to IoT – we still don't quite know where it will lead the data world!

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Working towards that vision, we have published over 3000 books and videos so far, providing IT professionals with the actionable knowledge they need to get the job done –whether that's specific learning on an emerging technology or optimizing key skills in more established tools.

As part of our mission, we have also awarded over $1,000,000 through our Open Source Project Royalty scheme, helping numerous projects become household names along the way.

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SKILL UP

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SYSADMIN & SECURITY SALARY & SKILLS REPORT

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‘WHAT YOU NEED TO KNOW TO EARN MORE IN SYSTEM ADMINISTRATION AND SECURITY’

THE MOST COMPREHENSIVE GLOBAL IT SALARY AND SKILLS SURVEY EVER.

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WHAT YOU NEED TO DO NEXT... 27

For companies and people all over the world Security and System Administration have become even more essential over the last few years, and for you, as a System Administrator, there are a few important decisions that can affect your entire career. You need to ask yourself questions such as:

- How is Big Data going affect you and your role? Do you need additional skills?
- Should you join a start-up, or go into an enterprise company?
- What skills do you need to keep up within an ever-changing environment?
- Which new technologies are in use the most?

The need to answer these questions led us to look at the community as a whole, and so we decided to launch our Skill Up campaign.

WHAT IS SKILL UP?

With our Skill Up survey we wanted to look at the tech community as a whole to identify upcoming trends over the next few years and share what you can do to ensure you get the most out of your career and skills. We divided our survey into 4 segments, Web Development & Design, Application Development, Security & System Administration, and Data Science & Business Intelligence. With over 20,000 responses, this is one of the most comprehensive surveys in recent years.

Specifically we asked:

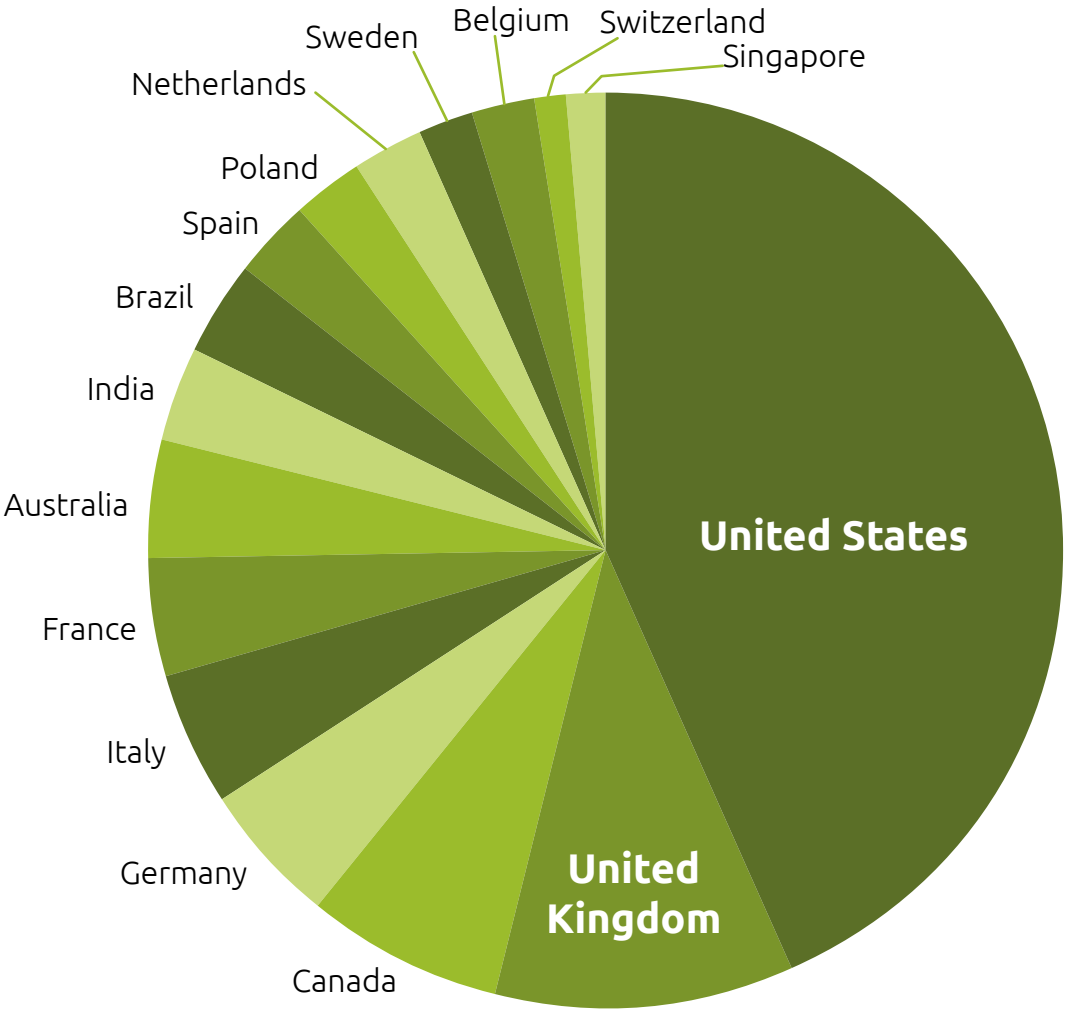
- What skills lead to a higher salary?
- What skills/technologies are most highly valued by different industries?
- What cutting edge technologies are really worth you spending your time learning?

To get a better idea of the community's thoughts we asked you all to fill in our survey, the results of which you can find compiled here in this report, giving you the facts, the figures, and more importantly – the knowledge and skills you need to make the best career decisions.

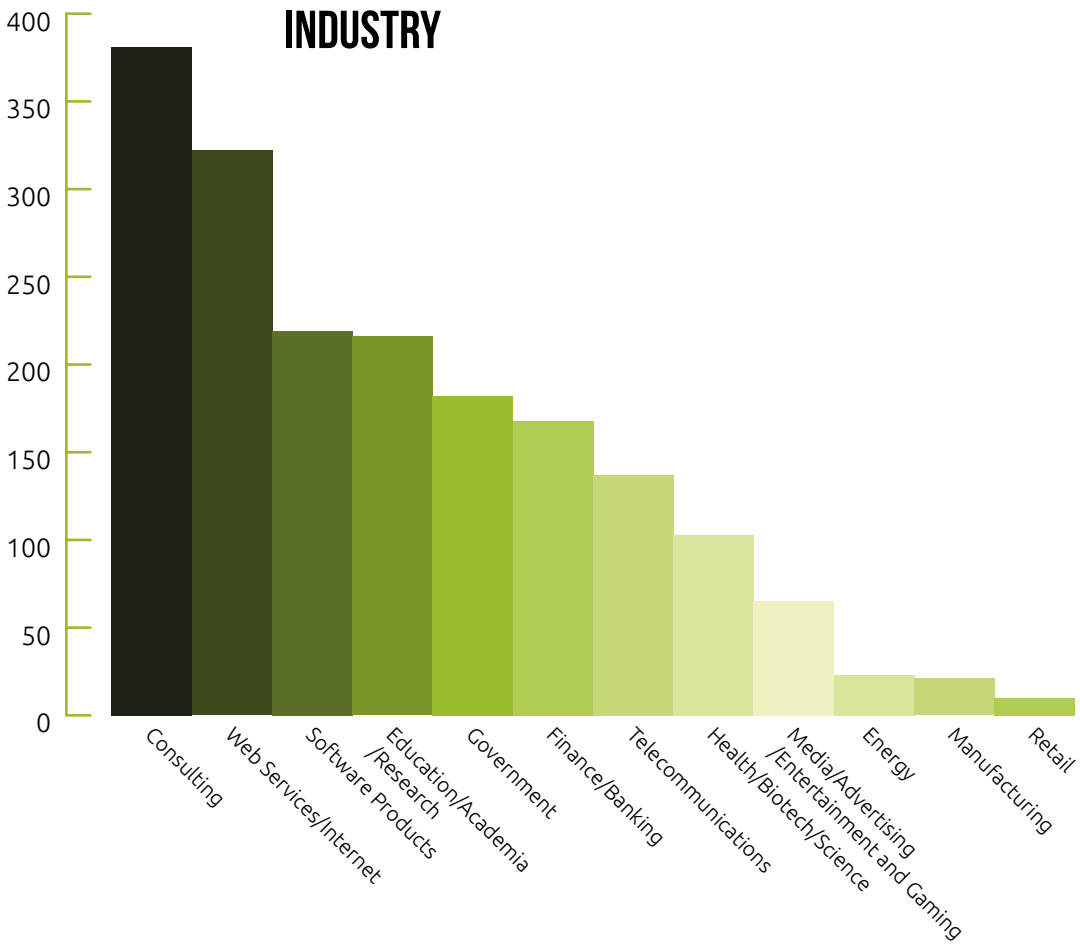
Let's look at the results in more detail.

WHAT WERE THE DEMOGRAPHICS OF THE SURVEY?

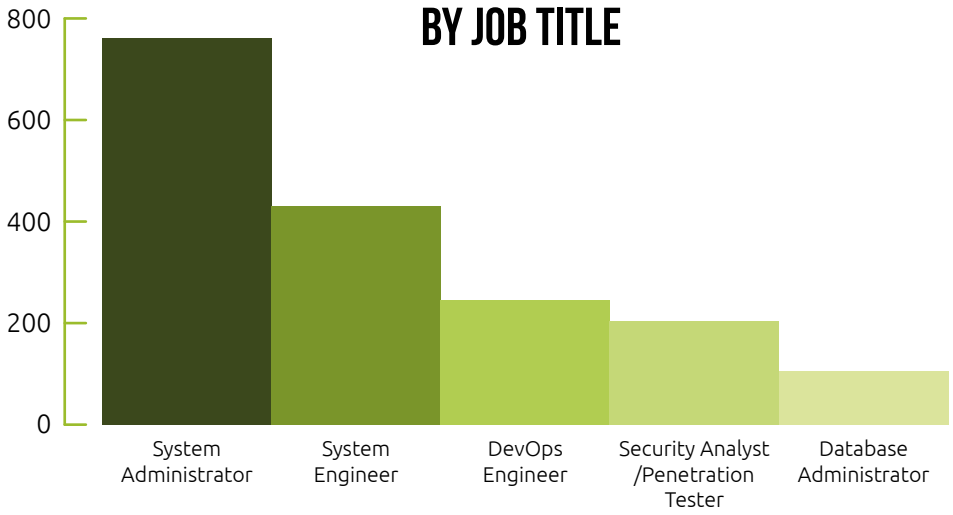
RESPONDENTS BY COUNTRY



The world of Security and System Administration is filled with System administrators from a number of different industries and experience levels, and from this combined wealth of knowledge we've discovered several interesting facts about certain industries that we'll look at in more detail.



This stream of our survey contained the most experienced people with an average of more than 15 years of experience, with a diverse range of roles represented across respondents:

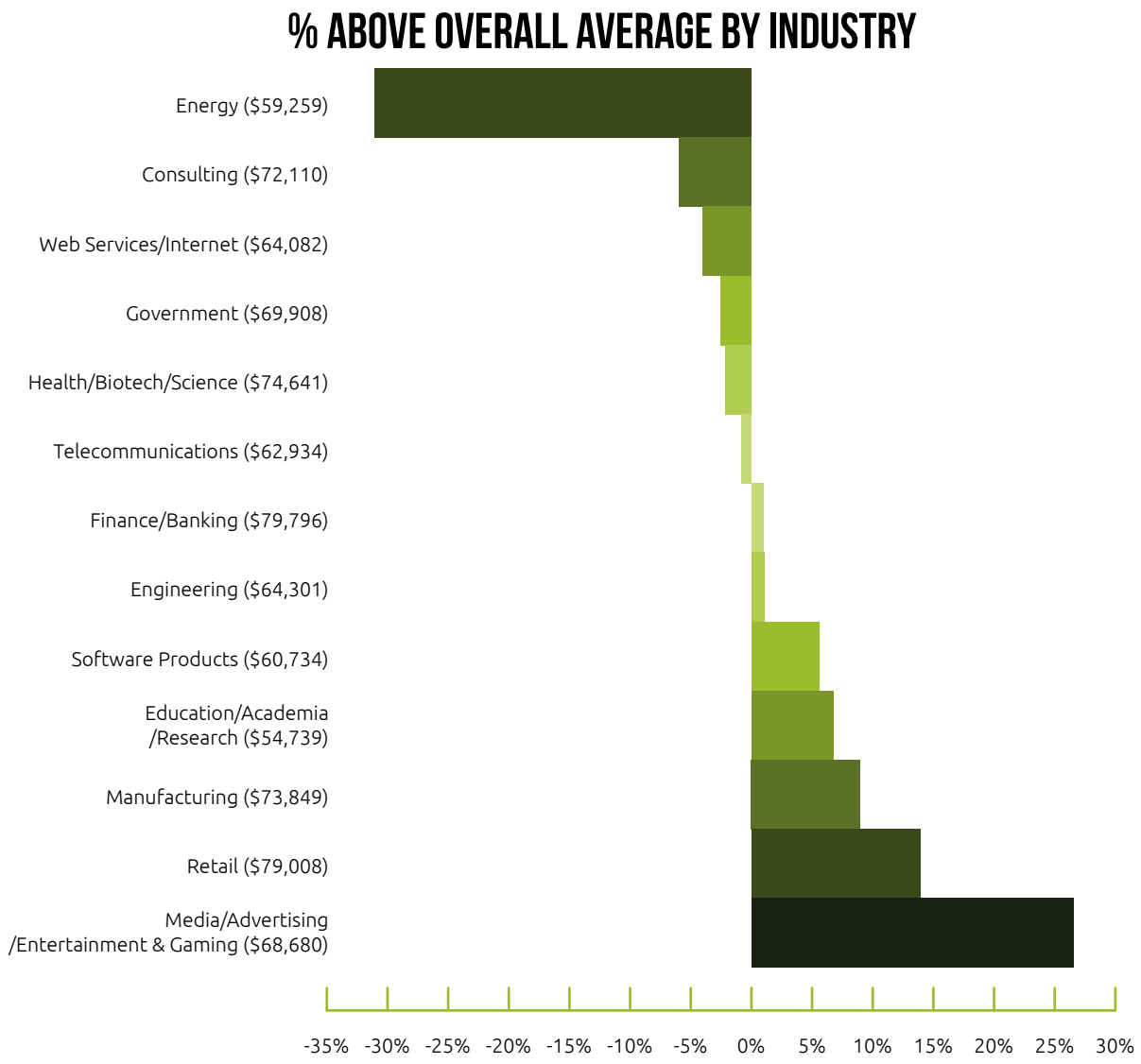


20% of our survey respondents work in IT security; the remaining 80% work in the broader category of IT administration, which contains four of the roles shown above.

WHICH INDUSTRIES PAY THE MOST?

With concerns around infrastructure and security becoming more prominent for almost all organizations, we wanted to find out if there was any area where these roles were particularly valuable, and in which areas sysadmins are being paid the most.

This graph shows how sysadmin and security salaries compare against all categories within our Skill Up survey.



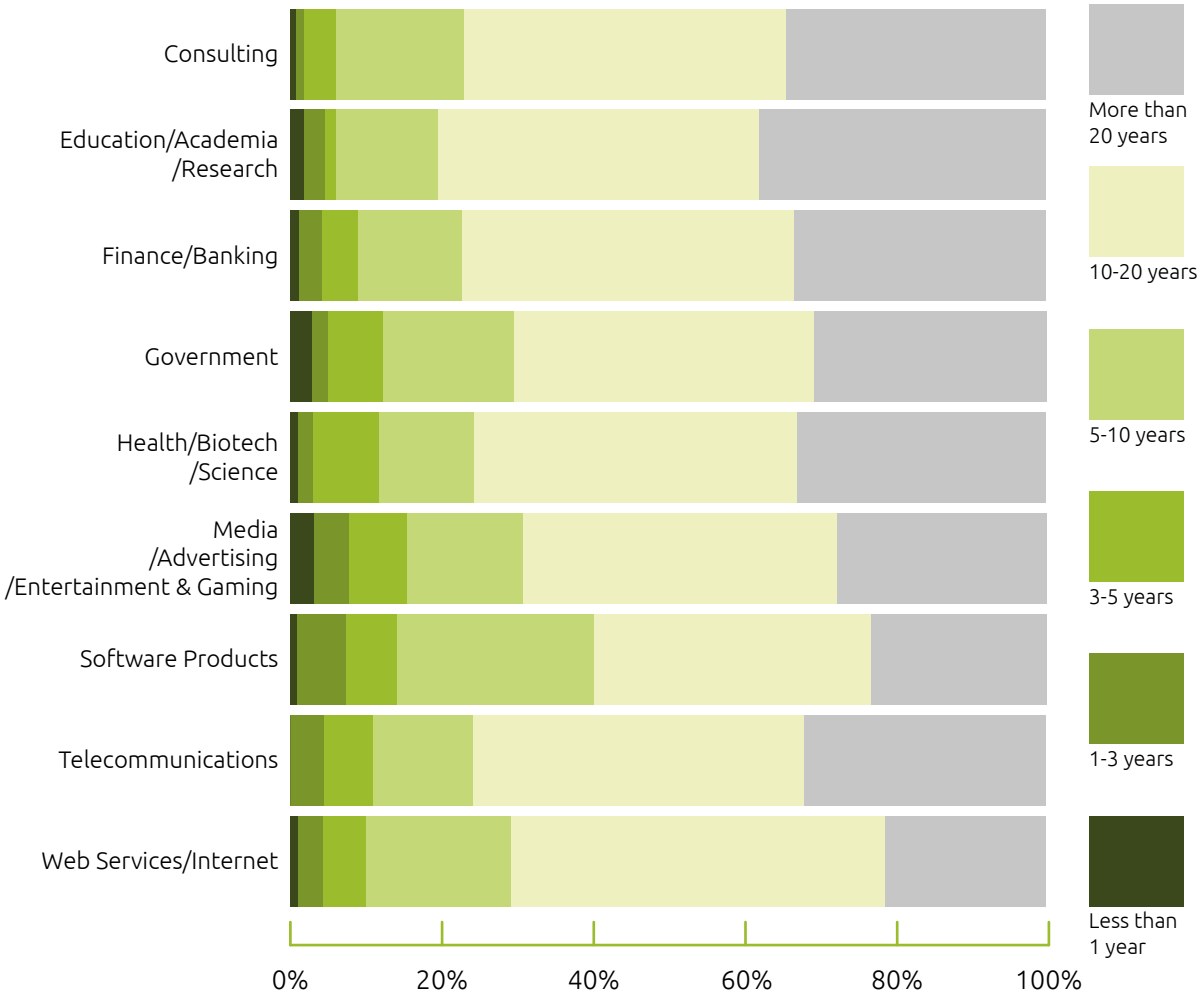
Media/Advertising/Entertainment and Gaming value administrative roles most highly. The salaries of respondents working in those areas were significantly over the industry average. This indicates just how important infrastructure is to organizations and the way in which they operate.

With the emphasis today on interaction and engagement externally, and agility and dynamism internally, it's not difficult to see exactly why administrative-focused technical roles are so highly valued.

Typically, Media, Advertising, Entertainment and Retail, are all industries that have a real reputation for relatively poor pay. Clearly, however, having very skillful people who are able to manage, develop and improve infrastructure and processes at a technical level is worth investing in!

INDUSTRIES AND EXPERIENCE

How do different industries break down by experience? Looking at this will give us an insight into where people are entering employment and an indication of where there are most opportunities.

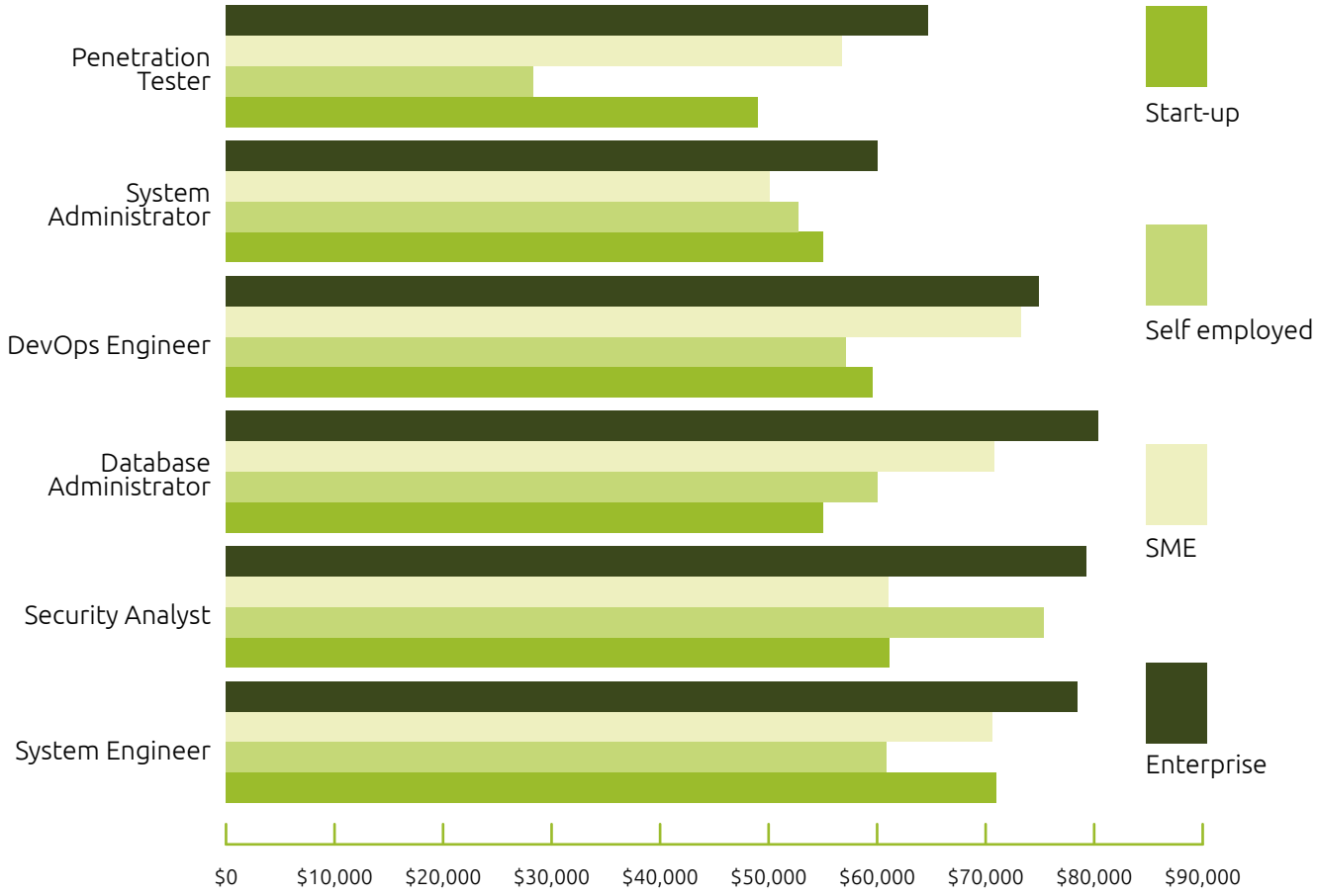


More respondents with less experience are working in Media/Advertising/Entertainment and Gaming than in any other industry. This indicates that these industries are looking to recruit young talent, possibly to support more experienced staff and grow their teams, but also to bring fresh perspectives to organizations eager to embrace change. Roles in these industries are a great place to start!

FROM START UPS TO ENTERPRISE: ADMINISTRATIVE ROLES IN DIFFERENT SIZE COMPANIES

Enterprise Database Administrators are earning the most, possibly due to the emphasis currently being placed on Big Data. Enterprise companies are investing a lot of money in Penetration Testers, which points to growing anxieties surrounding system security. Self-employed Security Analysts, who are likely to be working as consultants, can and do command high salaries. DevOps Engineers working in SMEs are paid almost as much than at enterprise level.

Let's look a little deeper into salaries by company type.

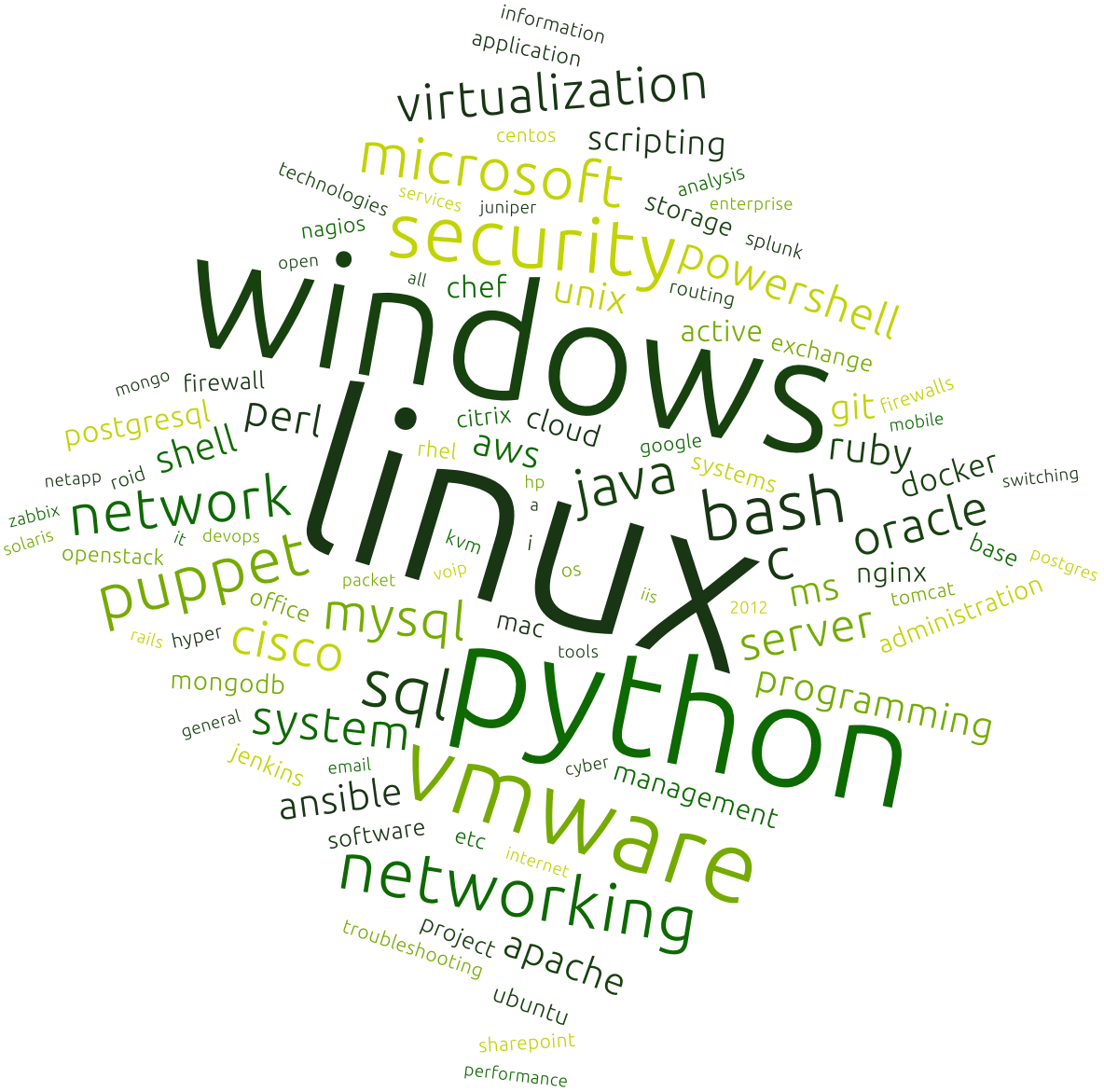


- Enterprise Database Administrators are paid the most. This is perhaps unsurprising given the dominance of Big Data at an enterprise level. Perhaps what we're seeing here is some crossover from administration to a more data-oriented role.
- Enterprise companies are investing money in Penetration Testers and Security Analysts, most of whom are likely to be working as consultants. Their experience is commanding a higher salary.
- The low salary of self-employed Penetration Testers suggests that penetration testing is something businesses want to do in-house. However for broader strategic insights and solutions, organizations are much keener to look externally. A great opportunity if you are thinking of making a change to your career or enhancing your skills.

TOOL USE ANALYSIS

We next looked at what areas our administrators and security experts are working in. Let's dig a little deeper to find out what tools they are using.

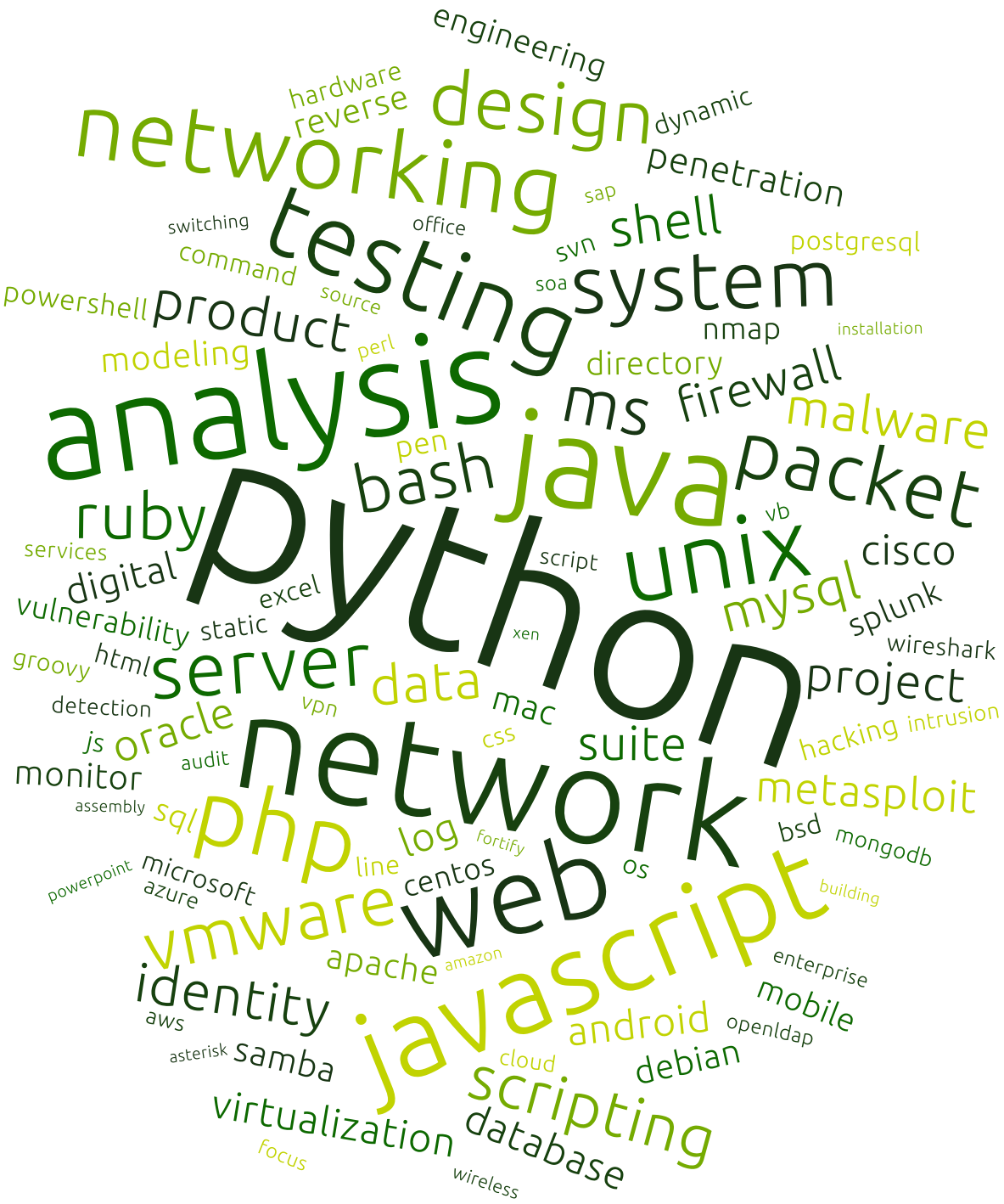
This tag cloud gives a broad overview of some of the most frequently used words given in response to our survey. It gives a clear indication of the breadth of tools used by respondents in this stream:



The two leading operating systems are most prominent here, but we can also see a wide range of tools for some very different tasks.

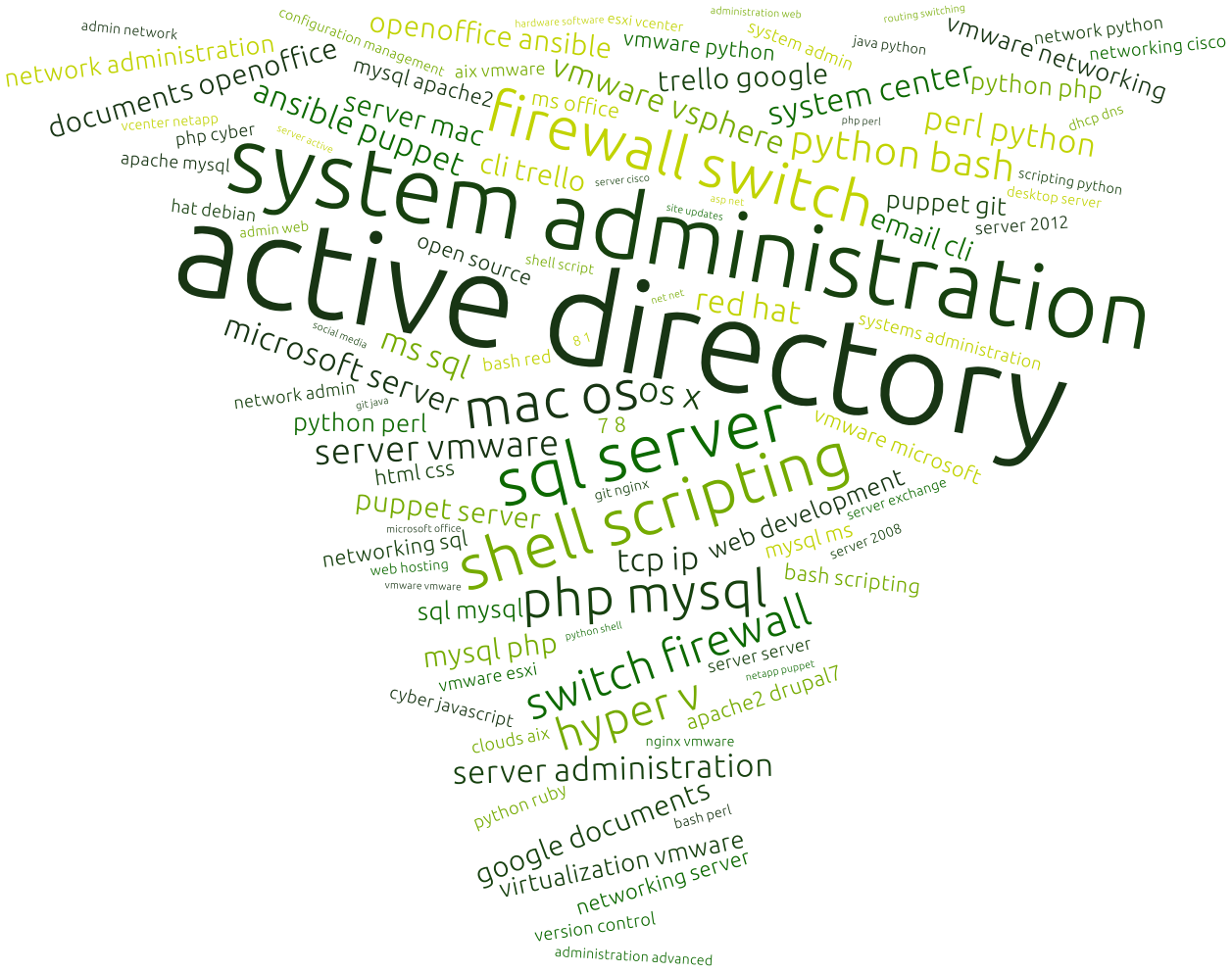
Let's go into more detail.

Here we separated the security respondents from the administrative responses to give us a clearer view on what both groups were using.



Python comes out on top, but also note the diverse tools referenced here. Kali Linux is evidently still a popular tool, as well as Metasploit and nMap, but the appearance of web based tools and languages also indicate exactly where security experts are focusing their attention.

SYSTEM ADMINISTRATORS / SYSTEM ENGINEERS



- Many enterprise products are being referenced here, Cisco, Citrix and VMware are all being used by a large number of system administrators and engineers.
- Interestingly a number of non-technical skills, such as 'coaching skills', 'change management' and 'project management', feature here. This indicates that those working in IT administrative roles are playing a key role in improving processes and driving change. These softer skills are quite different to the standard technical skills required for more traditional roles.
- 'Security' features in this tag cloud, suggesting a certain degree of crossover between administrative and security roles. Furthermore, this may indicate that stretched budgets and limited resources are leading many System Administrators and System Engineers to take on more responsibility for security issues.

WHICH TOOLS ARE RESPONDENTS PLANNING ON LEARNING?

We've now seen what skills respondents are currently using. We also want to know what tools they will be learning over the next six months.

These word clouds visualize the most frequent words in response to the question 'What tools are you planning to learn in the next six months?'

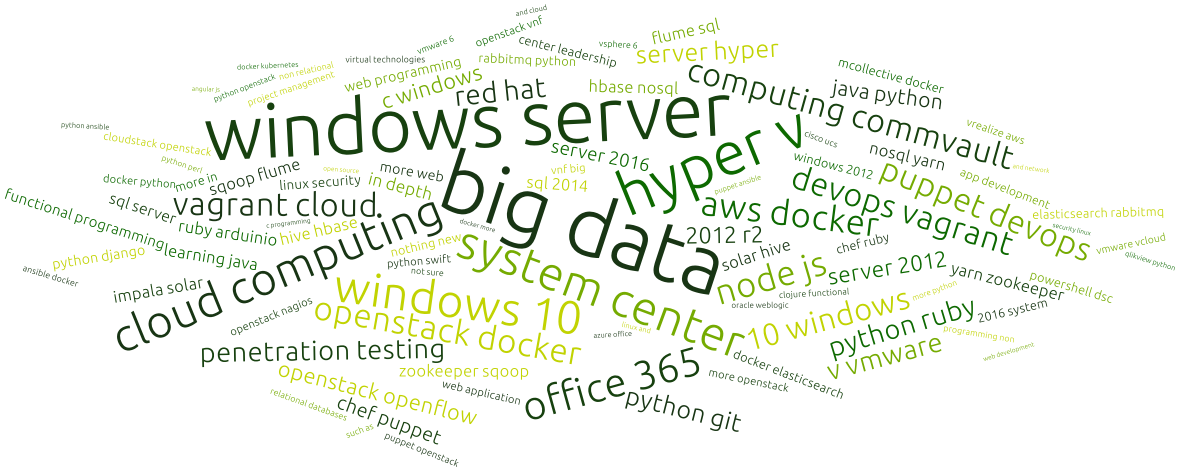
SECURITY ANALYSTS & PENETRATION TESTERS

- 'Malware analysis' comes out top, so clearly those working in security are interested in exploring how malware operates at a very deep level.
- 'Threat modelling' also appears prominently, emphasizing the fact that those working in security are looking to learn new tools and approaches to combat additional challenges and security threats.
- The appearance of 'Big Data', 'mobile development' and 'cloud architecture' highlights the fact that these broad tech trends will have to be addressed by security experts, so new tools can be developed to increase security around technical infrastructures.

Want to learn any of these tools? This bundle has got you covered:

- Kali Linux - Assuring Security by Penetration Testing
- Kali Linux Web App Testing [Video]
- Python Web Penetration Testing Cookbook
- Kali Linux: Wireless Penetration Testing Beginner's Guide, Second Edition
- Python Penetration Testing Essentials

SYSTEM ADMINISTRATORS/SYSTEM ENGINEERS



Microsoft products dominate the field when it comes to System Administrators/System Engineers' plans for learning over the coming months. Virtualization is a hot topic too. It's interesting to see that some of our respondents want to learn 'advanced Python', possibly an indication of the increasing prominence of data analysis and Big Data.

Once again, we can also see a number of references to non-technical skills such as 'project management' and the phrase 'communicate technically' further indicates the pressure placed on System Engineers to implement change and drive improvement through new tools.

Grab these guides and get ahead of the trend in the world of System Administration:

- Puppet Cookbook - Third Edition
- Linux Shell Scripting Cookbook, Second Edition
- Learning OpenStack Networking (Neutron)
- Functional Python Programming
- Web Penetration Testing with Kali Linux

CHALLENGES AND OPPORTUNITIES: EMERGING TRENDS FOR THE NEXT 12 MONTHS

As well as investigating what tools people are planning to learn, we also wanted to find out what they saw as the key trends likely to dominate their field over the course of the next 12 months.

This tag cloud visualizes their responses:

Dare we point it out? Cloud dominates here! This indicates that there is still a demand for new storage and collaboration solutions. Since Cloud has been around for a number of years already, whether it is an emerging technology can be argued. Is the renewed emphasis on Cloud migration related to finding effective solutions for new challenges in technology?

Containerization is also a very big topic – largely driven by Docker. Could this suggest that Docker is now so popular it has become a metonym for containerization?

Automation also appears prominently, along with a number of references to configuration management tools such as Ansible and Puppet. Evidently solutions that allow System Administrators and System Engineers to simplify the way they manage their infrastructure will become more and more popular.

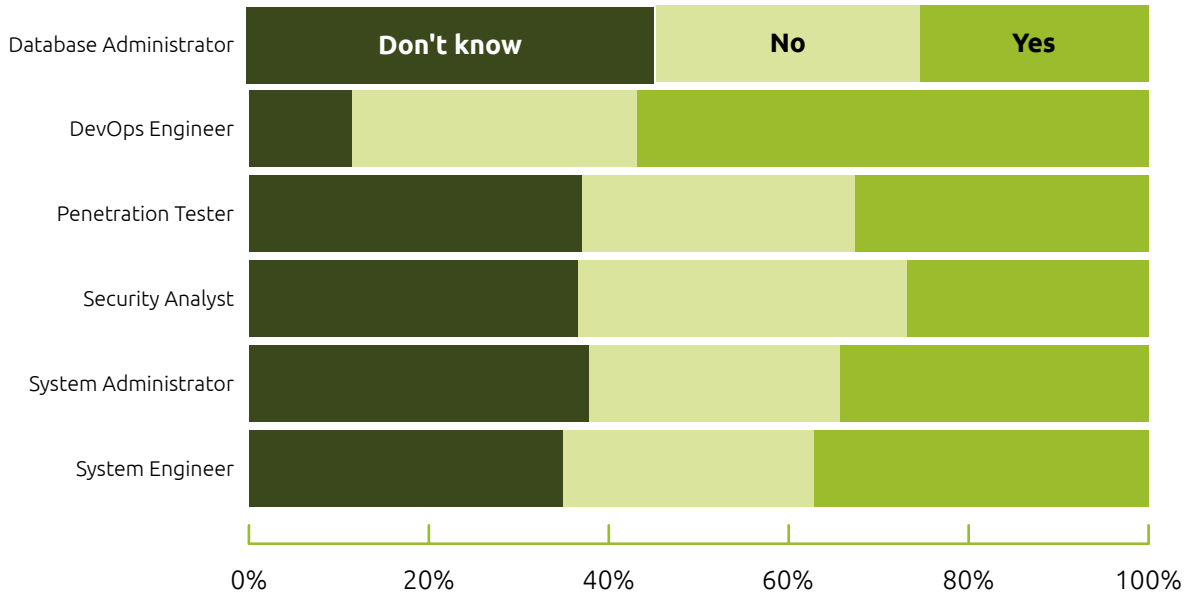
Dive into the world of Configuration Management with this bundle:

- Puppet Essentials
- Learning Chef
- Learning Ansible
- Learning SaltStack
- Vagrant Virtual Development Environment Cookbook

HOT TOPIC ANALYSIS

We wanted to see how our respondents felt about some of the biggest issues and hottest topics in their field at the moment.

DO YOU SEE TOOLS SUCH AS VAGRANT AND DOCKER DISRUPTING THE WAY YOU WORK IN THE FUTURE?



Generally, there's a relatively even split. The obvious exception is DevOps Engineers for whom the answer is a much more resounding 'yes'.

It interesting to note that even among DevOps Engineers, there is still a significant minority of respondents that said 'no', DevOps Engineers have a much clearer opinion on this issue, with very few responding 'don't know'!

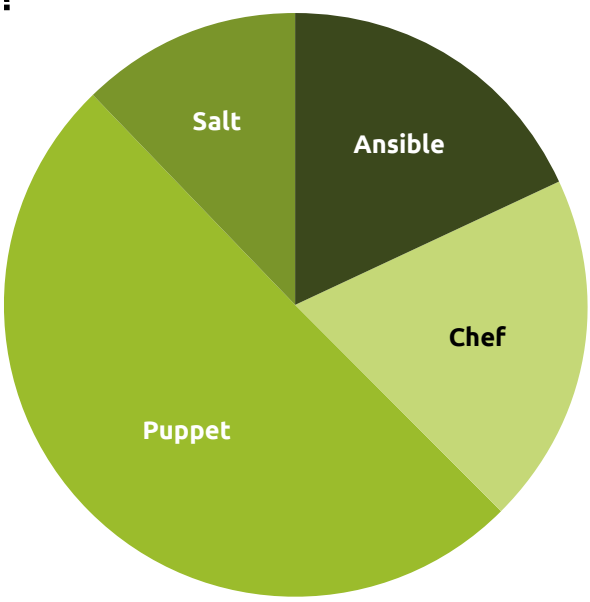
Those that replied 'no' could have done so for a number of reasons.. As the question asks if it could disrupt 'the way you work', those DevOps Engineers who are already using Vagrant and Docker, won't see it as a future challenge to their practices and methods.

Want to learn more about containerization? Don't miss this incredible bundle of top titles:

- Orchestrating Docker
- Docker for Web Developers [Video]
- Build Your Own PaaS with Docker
- Docker Cookbook
- CoreOS Essentials

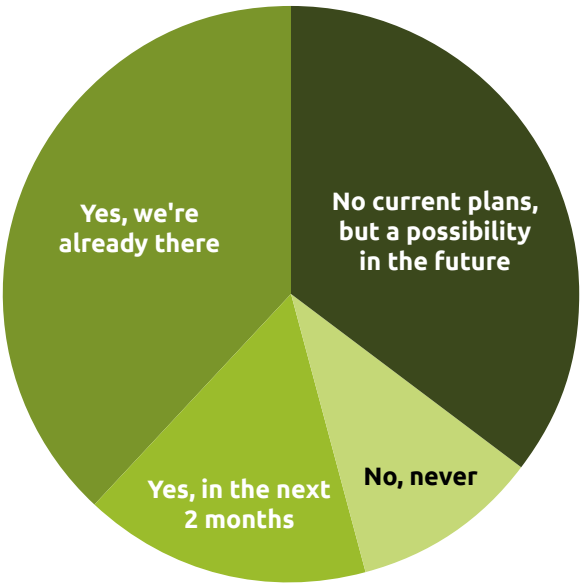
CONFIGURATION MANAGEMENT TOOLS

WHO HAS WON THE WAR ON CONFIGURATION MANAGEMENT OUT OF THE FOLLOWING TOOLS?



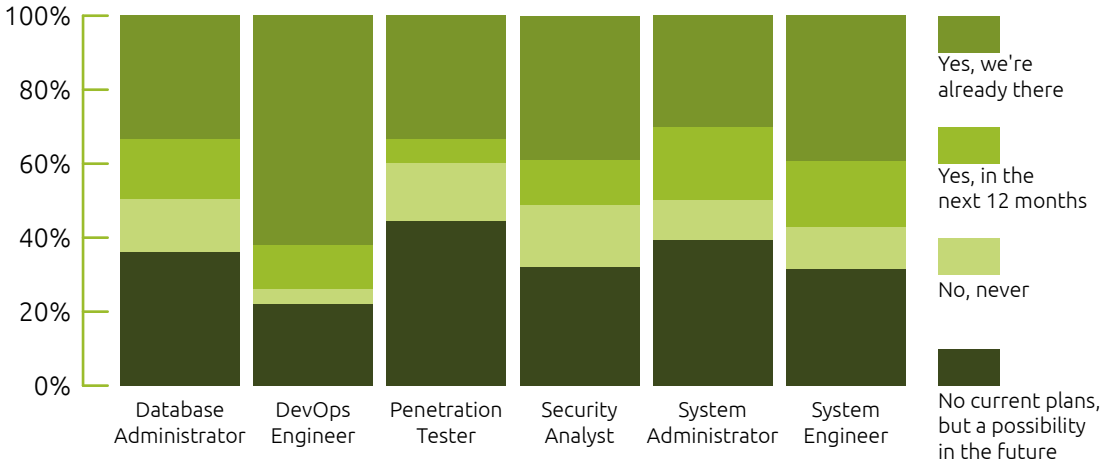
- Puppet dominates the field when it comes to Configuration Management. Its established popularity has been growing, with its large installation and developer base likely to consolidate its position as the most popular CM tool.
- Chef, which makes use of Ruby, is a general-purpose language that certainly isn't that intuitive or easy to learn. Nor is it specifically built for the challenges of configuration management.
- It will be interesting to see how Salt, Chef and Ansible develop over the next year or so and what new features they implement to tackle Puppet's dominance.

IS YOUR COMPANY CONSIDERING MOVING TO A CLOUD-BASED INFRASTRUCTURE?



A distinct majority of companies already have, or are planning to move to a cloud-based infrastructure. A combination of resourcing issues and the need for flexibility and agility, more remote working and bring your own device (BYOD) may well be driving this trend, suggesting Cloud will become standard over the next few years.

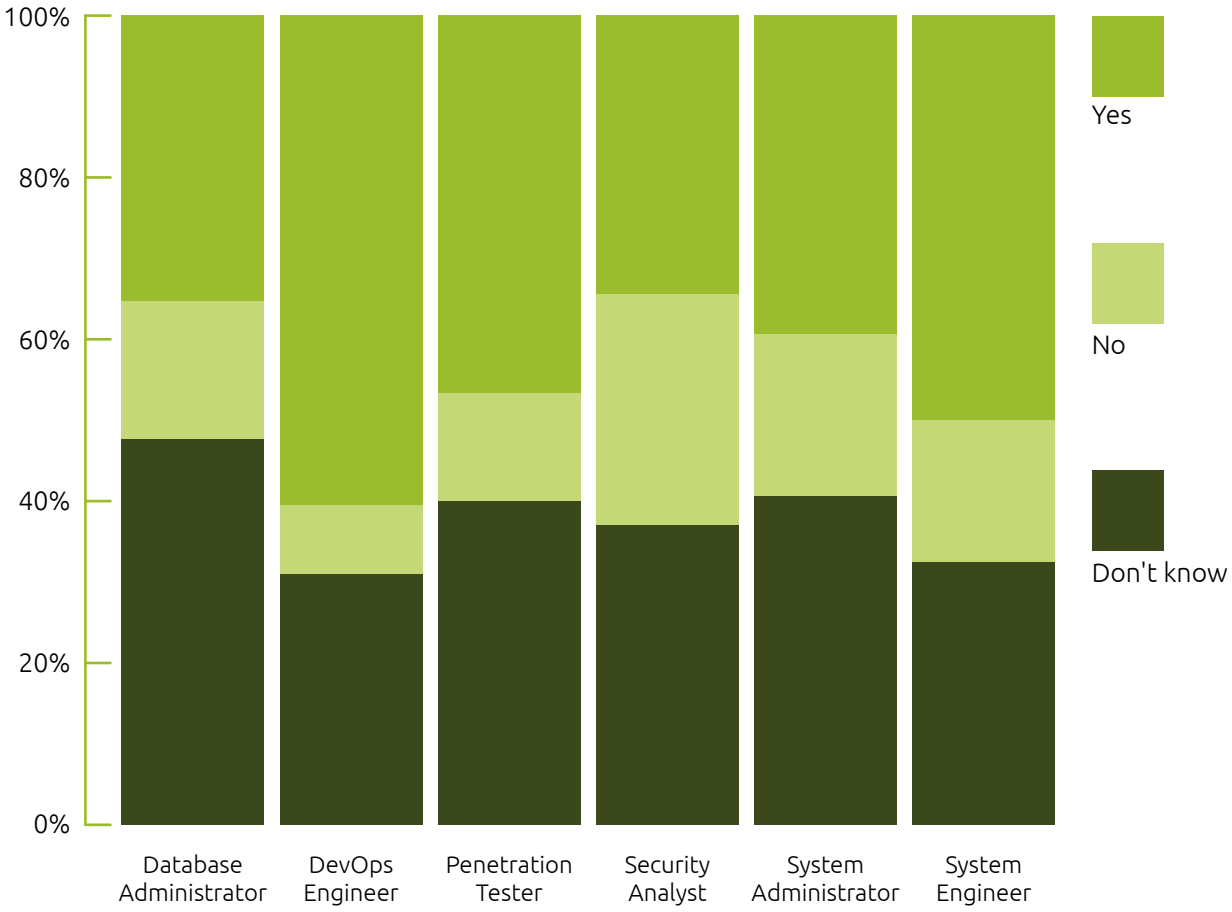
Looking at this question in more detail, what were the responses by job title?



- Almost 75% of companies that implement DevOps practices have already, or are planning to move to the Cloud.

It could be argued that you can't utilize DevOps effectively unless you are using the Cloud. The question of whether you need DevOps to make full use of Cloud technology is another conversation! It is likely that we will continue to see a movement towards more collaborative ways of working over the next few years, if not explicitly driven by DevOps, then certainly inspired by its philosophy.

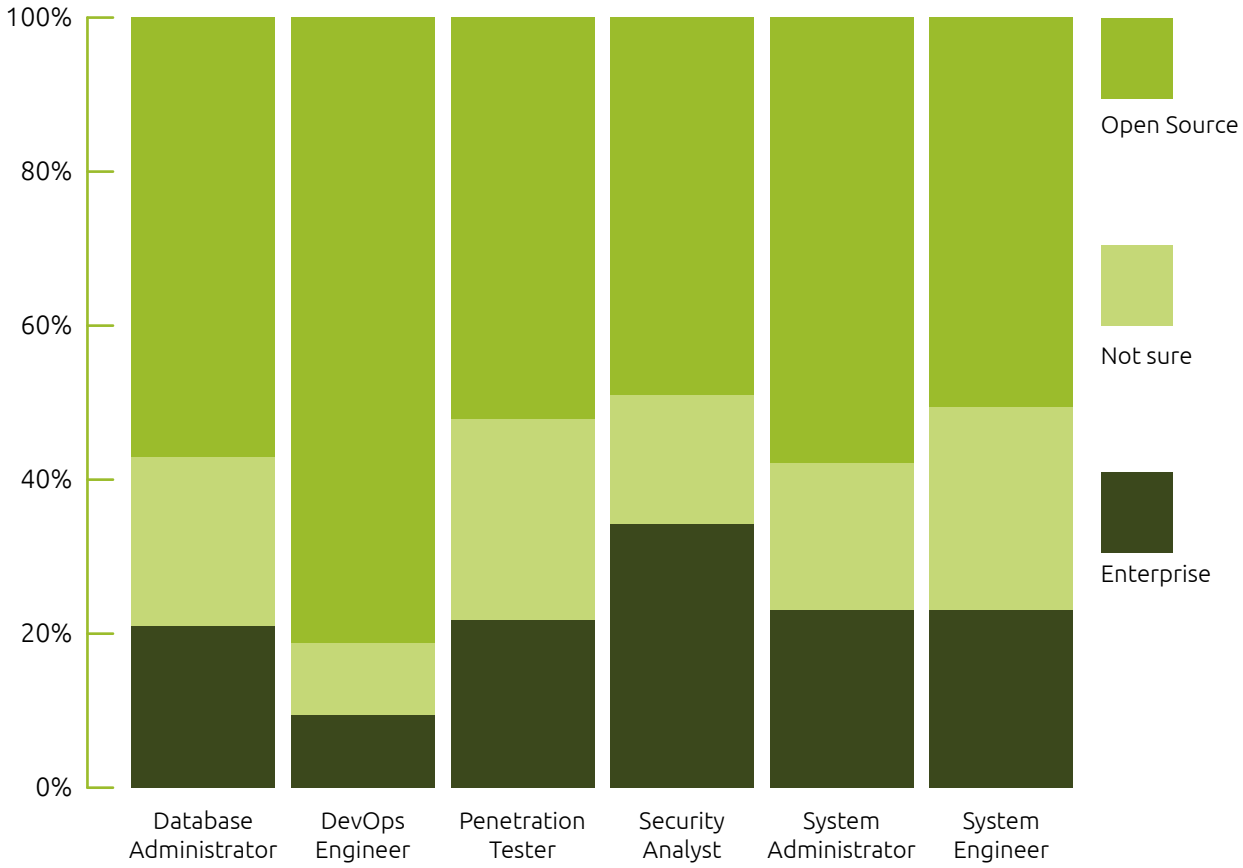
IS THE RISE OF THE 'X AS A SERVICE' TREND A GOOD THING FOR SYSTEM ADMINISTRATORS?



- There is no clear consensus on this issue with just under 40% of System Administrators agreeing with the statement, and just over 40% not sure.
- DevOps Engineers were not backwards in coming forwards here! Referring back to the topic of Cloud in relation to DevOps practices, it's not difficult to see why DevOps engineers would be so positive about XaaS, given its dependence upon Cloud.
- The Security Analysts' response was in contrast to the DevOps Engineers. 30% of respondents didn't think XaaS would be good for System Administrators, more than any other group (including sysadmins themselves)! Added security pressures that come with Cloud and XaaS technologies and Cloud security concerns have underlined the potential dangers of housing data in an external resource.

It may not simply be the case that Security Analysts believe XaaS to be particularly vulnerable (although there might well be some truth in that), but they might also perceive the System Administrator role as being further burdened by security concerns as the XaaS trend increases.

DOES THE FUTURE OF VIRTUALIZATION LIE IN OPEN SOURCE OR ENTERPRISE TECHNOLOGIES?



Broadly, there is a consensus that the future of virtualization lies with Open Source tools. Clearly, however, DevOps Engineers are the most convinced by Open Source. This is unsurprising given the fact that Open Source affords a lot more opportunities for customization and experimentation, key elements in the DevOps philosophy.

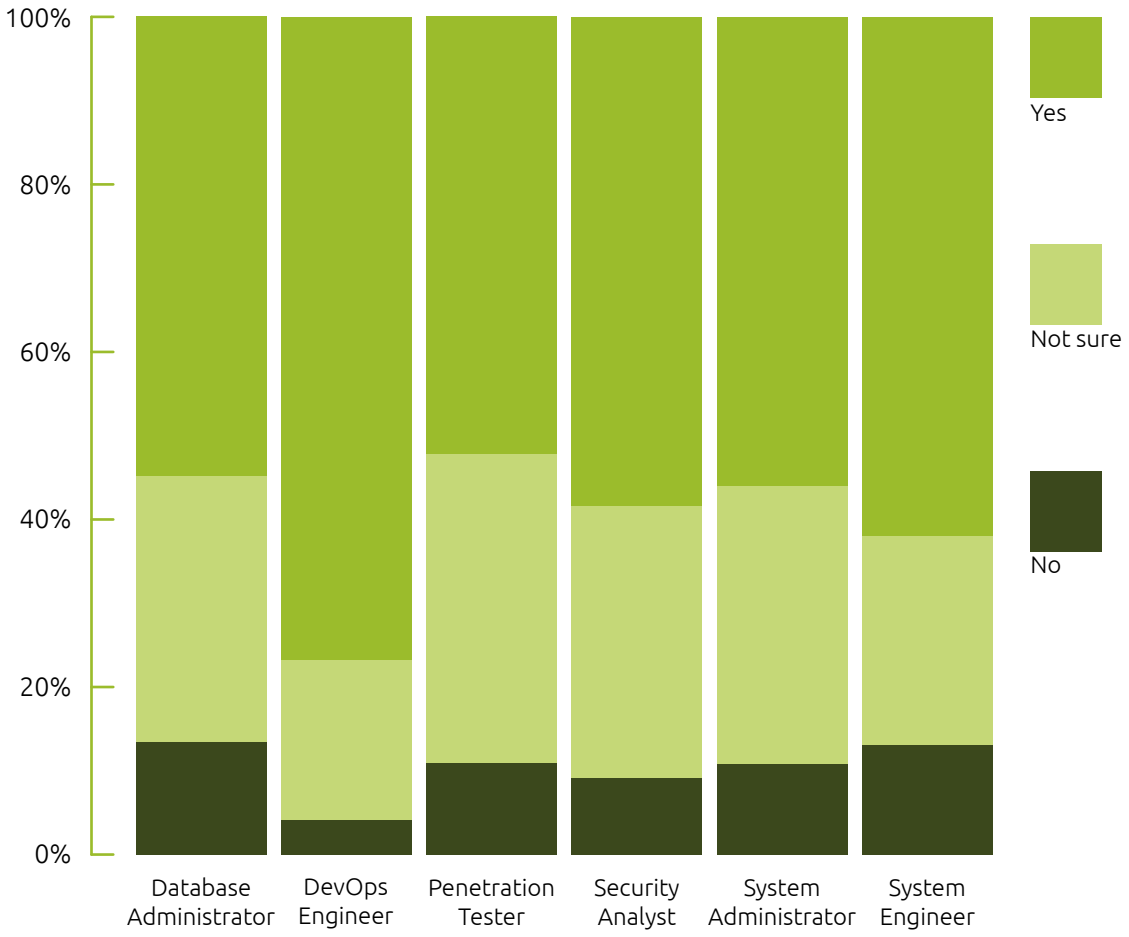
Echoing the earlier contrast, Security Analysts (the group with the highest proportion of respondents) believe the future of virtualization lies with Enterprise tools. Although the majority of Security Analysts thought Open Source was likely to be the future, the fact that the most significant minority of respondents in favor of Enterprise were Security Analysts suggests, in relation to Open Source, they are a skeptical bunch!

HOT TOPICS: DEVOPS

As our research has indicated throughout this report, DevOps is a trend that appears to have a wide and almost disruptive influence on the way in which we understand and manage IT infrastructures.

To get a sense of how DevOps fits into the overall picture of system administration, we asked our respondents this question:

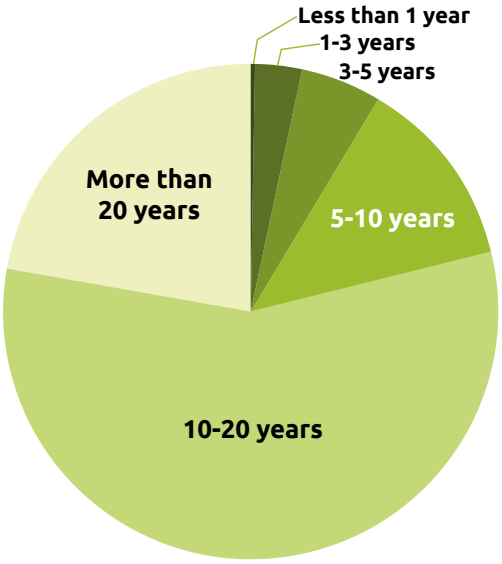
DO YOU SEE THE NUMBER OF DEVOPS ENGINEERS INCREASING IN THE NEXT 12 MONTHS?



Although there is an obvious bias from DevOps Engineers, respondents from all roles believe there will be an increase in DevOps roles over the next year.

Given that DevOps is perceived to be such an important trend, we looked more closely at exactly who is working in DevOps now.

HOW MUCH EXPERIENCE DO THEY HAVE?



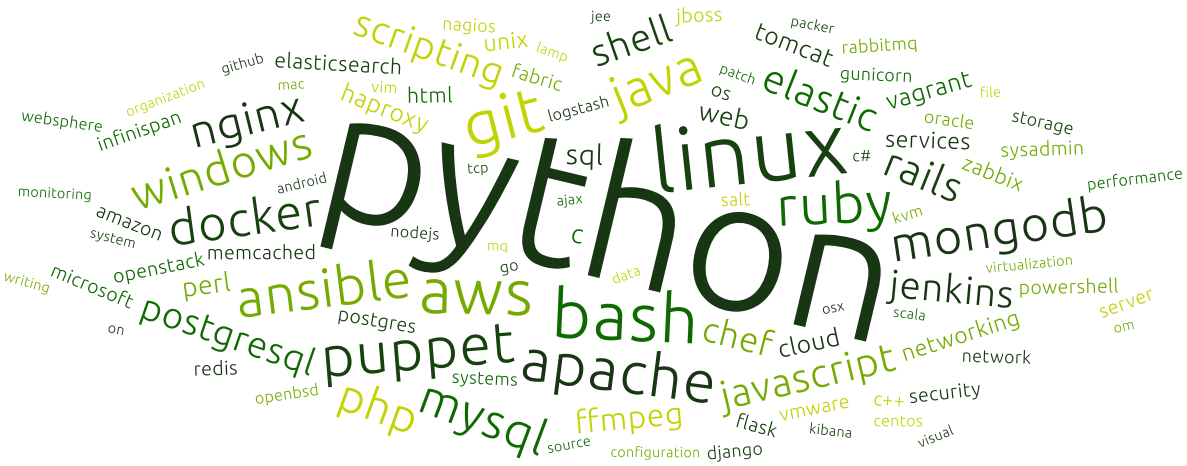
DevOps practitioners are highly experienced people. This is not much of a surprise, as it is a highly skilled role that requires technical knowledge and business/project management experience.

- Our DevOps respondents earn an average salary of $70k.
- Those working in SMEs and Enterprise companies are earning $5k more on average than those who are Self-Employed or working in Start-ups.

DEVOPS TOOLS

We've talked a lot about the DevOps philosophy, but what tools do DevOps Engineers use day-to-day?

This tag cloud visualizes the responses from DevOps Engineers about the tools they use:



- Puppet dominates as the go-to Configuration Management tool.
- Python also dominates as the key language. It is difficult to say if there's anything specific about Python for DevOps Engineers. It's certainly popular, and its flexibility makes it an obvious choice for a DevOps Engineer working in a very multi-faceted role.
- What's most significant here is the diversity of tools on display, which emphasizes the diversity of the DevOps role.

The presence of tools like Gunicorn, JBoss/ Wildfly and other server tools suggests a tendency for DevOps engineers to develop their own applications for their work, and indicates a move towards a certain degree of technical 'self-sufficiency'.

The presence of many diverse NoSQL data handling technologies (MongoDB, Redis, ElasticSearch, etc) suggests these are the types of tools DevOps Engineers would use to tackle data.

Dive into the world of DevOps with our hand-picked selection of titles:

- Continuous Delivery and DevOps: A Quickstart Guide - Second Edition
- Mastering Python [Video]
- Mastering Git [Video]
- Mastering Puppet
- Jenkins Continuous Integration Cookbook - Second Edition

What's also interesting are the skills we see when we use a tag cloud to visualize the results.

We don't see quite so many tools and technologies, but we can see the non-technical skills that are essential for DevOps Engineers:

'People skills' and 'technical leadership' stand out here, demonstrating the unique position of DevOps Engineers within their organizations. Their work exceeds the purely technical. If we are going to see an increase in the number of DevOps Engineers over the next 12 months, as many of our respondents believe, then it will become crucial to cultivate these skills, which are, arguably, even more difficult to develop than purely technical knowledge.

We've now seen what DevOps Engineers are using. We also looked at what they wanted to learn:

- 'More Python!' is the message here, a testament to the extensive capabilities of the language and the fact that, as mentioned earlier, it can be used for such a huge range of tasks.
- ID Management also presents another interesting challenge to DevOps Engineers – this might be an emerging solution to the general trend towards increased collaboration and more open ways of working within and across teams.
- It's also interesting to see the presence of 'Big Data' and 'Machine Learning' here. This suggests an increasing emphasis on using some data science techniques in every day DevOps practices, as well as a move towards new ways of delivering business intelligence and data insights to improve strategic decision-making.

SUMMARY

The presence of DevOps has been large in our results – and underpins a transformation in the way infrastructure is understood and managed in organizations. Reliability and security are still essential, and Enterprise tools still dominate the world of System Administration. However, there is an increasing need for agile solutions that can improve processes and make organizations more dynamic, particularly in fast-changing areas of the economy. It's not just DevOps that's important here – we've seen that Data Architects have a very distinct value too, demonstrating that it's not simply about a label or a philosophy, but is more specifically about an ability to develop and implement solutions.

WHAT YOU NEED TO DO NEXT...

- Learn more languages. We've seen that the most successful people in this field are polyglots, capable of using a wide range of languages.
- If you don't fancy learning a new language, learn more Python!
- If you're in security, make sure you're up to speed with the latest Penetration Testing techniques. As security concerns become more and more prominent, it's a comprehensive way of identifying and then eradicating vulnerabilities in your systems.
- Embrace automation. Configuration management tools are your friend! Take the time to master automation, so you can start focusing on other areas of optimization and improvement.
- Make sure you're up to speed with Docker and containerization.
- Start thinking strategically. Being able to implement new tools and drive improvement programs is where the real value is for anyone working with IT infrastructures. To do this you're going to need to learn how to effectively manage and lead others.

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Founded in 2004 in Birmingham, UK, Packt's mission is to help the world put software to work in new ways, through the delivery of effective learning and information services to IT professionals.

Working towards that vision, we have published over 3000 books and videos so far, providing IT professionals with the actionable knowledge they need to get the job done –whether that's specific learning on an emerging technology or optimizing key skills in more established tools.

As part of our mission, we have also awarded over $1,000,000 through our Open Source Project Royalty scheme, helping numerous projects become household names along the way.

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‘WHAT YOU NEED TO KNOW TO EARN MORE IN WEB DEVELOPMENT’

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For companies and people all over the world web development & design choices have become even more essential over the last few years, and you, as a web developer, have to make a few important decisions that can affect your entire career as well. You need to ask yourself questions such as:

- Are Emerging Economies taking a growing slice of the web job pie?
- Should you join a start-up, or go into an enterprise company?
- How valuable is being a Full-stack Developer?
- Is Angular 2.0 going to take over the world of web development?
- Is mobile going to change the way web developers work permanently?
- What's the hottest upcoming trend in Web Development?

The need to answer these questions led us to look at the community as a whole, and so we decided to launch our Skill Up campaign.

WHAT IS SKILL UP?

With our Skill Up survey we wanted to look at the tech community as a whole to identify upcoming trends over the next few years and share what you can do to ensure you get the most out of your career and skills. We divided our survey into 4 segments, Web Development & Design, Application Development, Security & System Administration, and Data Science & Business Intelligence, making this one of the most comprehensive surveys in recent years.

Specifically we asked:

- What skills lead to a higher salary?
- What skills/technologies are most highly valued by different industries?
- What cutting edge technologies are really worth you spending your time learning?

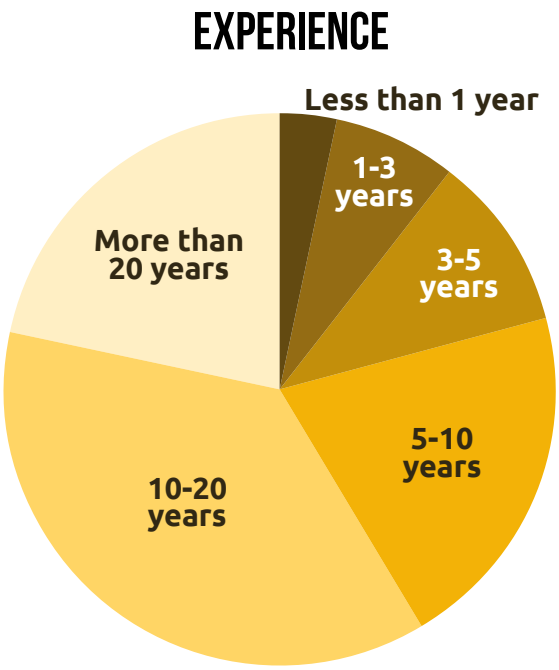
To get a better idea of the community's thoughts we asked you all to fill in our survey, the results of which you can find compiled here in this report, giving you the facts, the figures, and more importantly – the knowledge and skills you need to make the best career decisions.

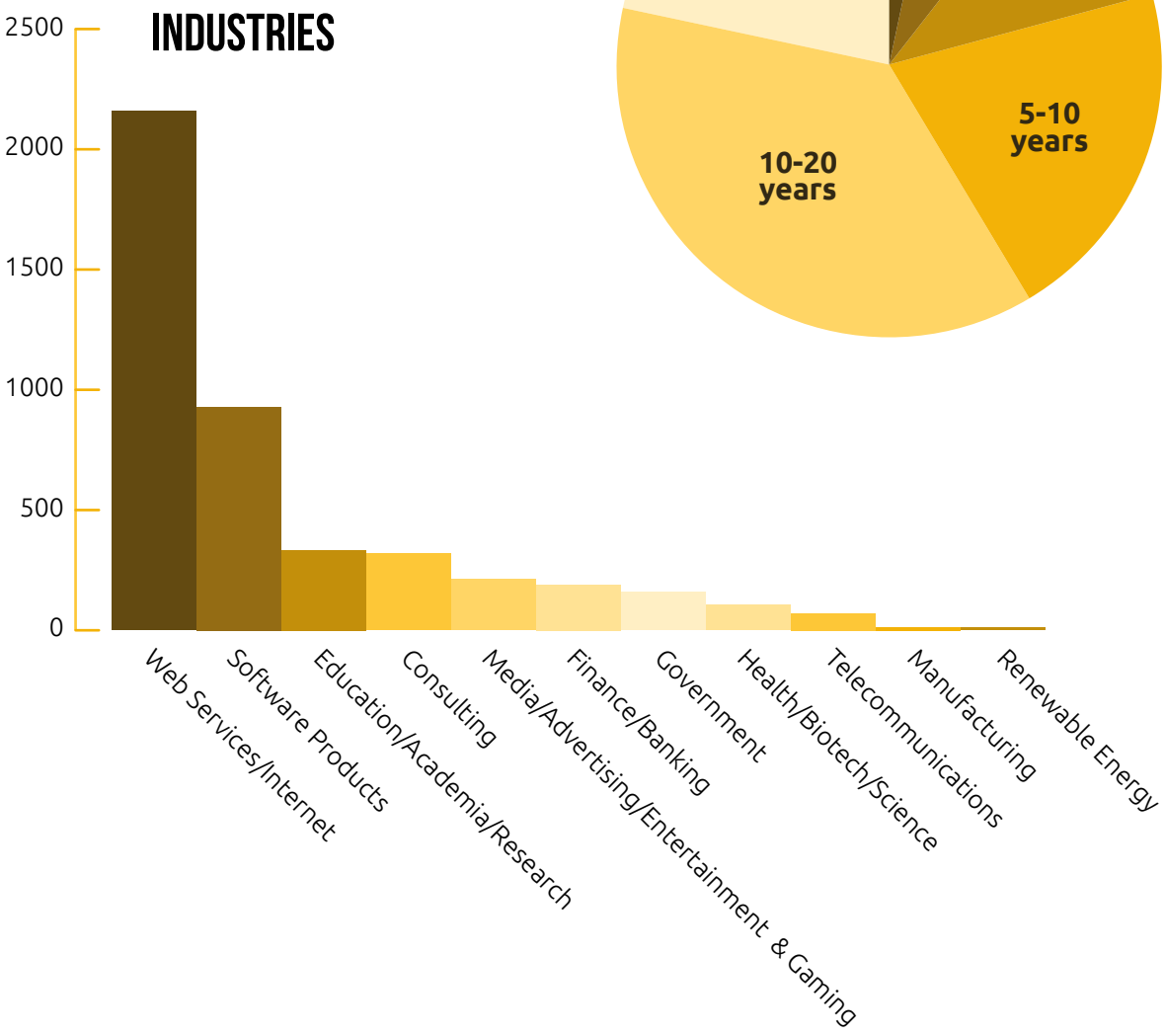
Let's look at the results in more detail.

WHAT WERE THE DEMOGRAPHICS OF THE SURVEY?

The response from our community was huge – with almost 20,000 responses from developers across nearly 100 different countries, so thank you!

Of the four skill streams, our Web Development stream had one of the highest responses with 6,000 different developers from a wide variety of industries and experience levels. To give you an idea of the different industries your fellow developers come from we've drawn up some graphs on both the levels of experience and the number of people working in each industry who use their web development skills every day:



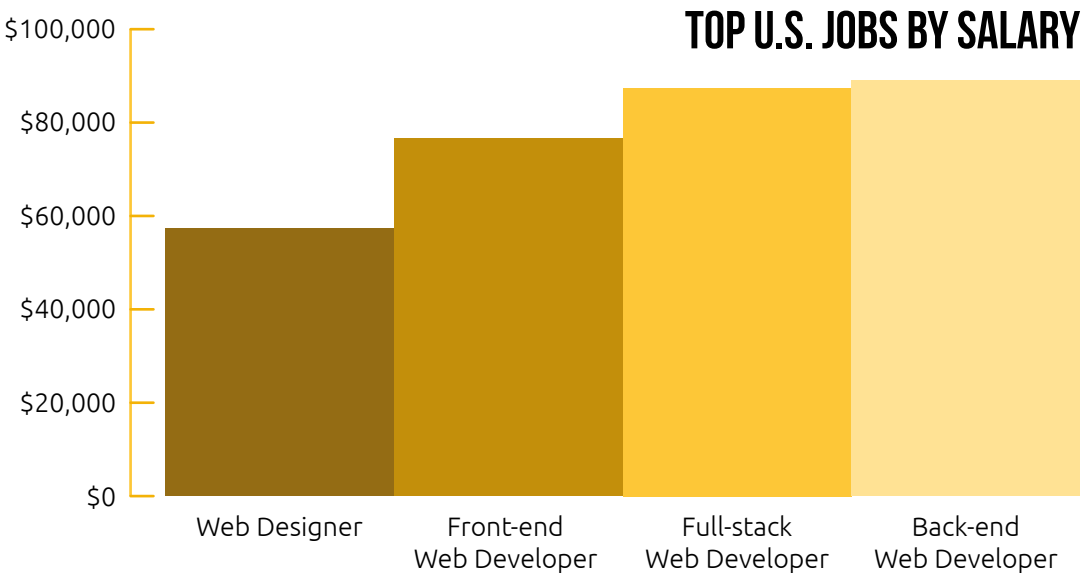


As we can see, the web developer world is filled with developers from a number of different industries and experience levels, and from this combined wealth of knowledge we've discovered several interesting facts about particular industries that we'll look into further on.

WHICH SKILLSETS ARE TOP FOR WEB DEVELOPERS / DESIGNERS?

Breaking down the role of web developer depending on the core skills they offer, there has grown a difference in average salary for each sector.

The following graph shows the average global salary for each type of web developer, converted into US dollars:



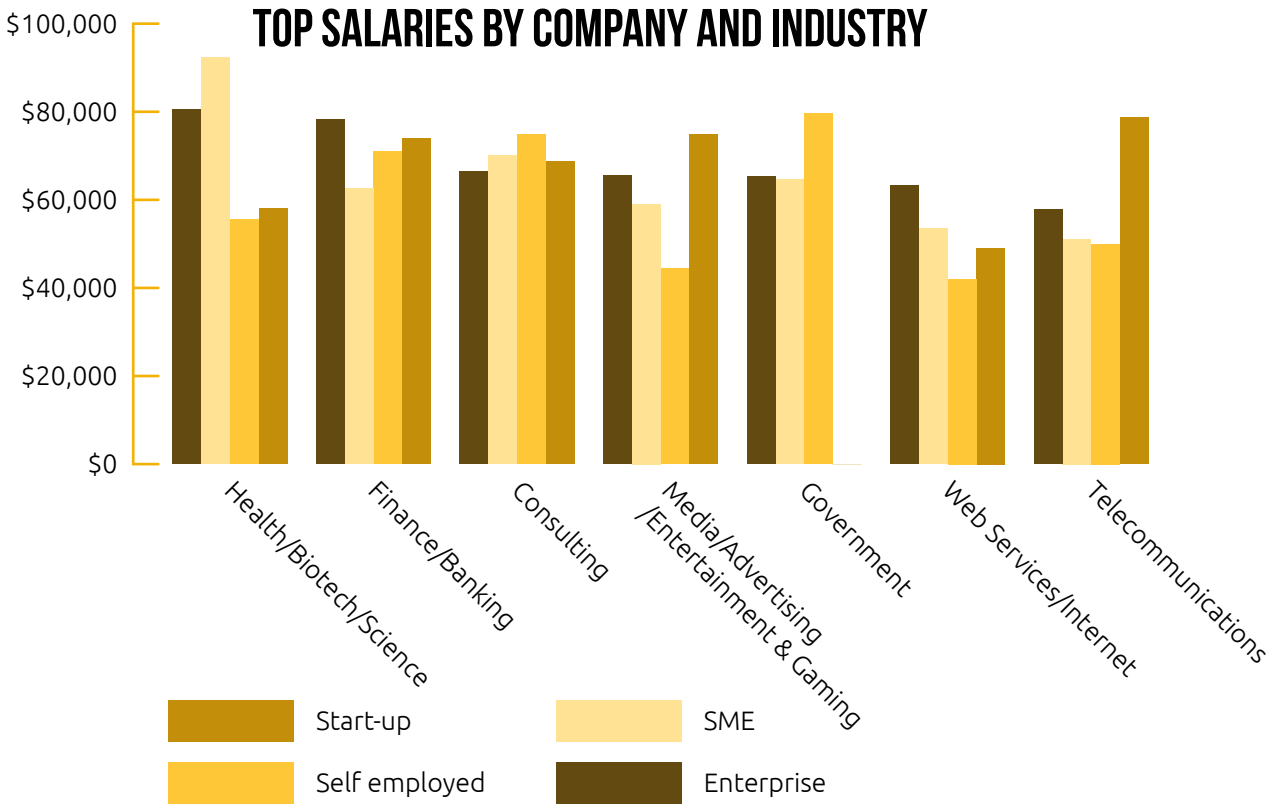
Back-end Web Developers have taken the top spot, but Full-stack Developers are catching up. Given the desire for employers to have someone who can handle multiple aspects it's likely that this may increase in the future.

Don't miss out on what Full-stack Development can do for your job prospects now! Here's a bundle of some of our hottest and best titles to make sure you've got the skills you need:

- MEAN Web Development
- Node.js Design Patterns
- Learning Web Development with Bootstrap and AngularJS
- Web Development with Node.JS and MongoDB
- Mastering MEAN Web Development [Video]

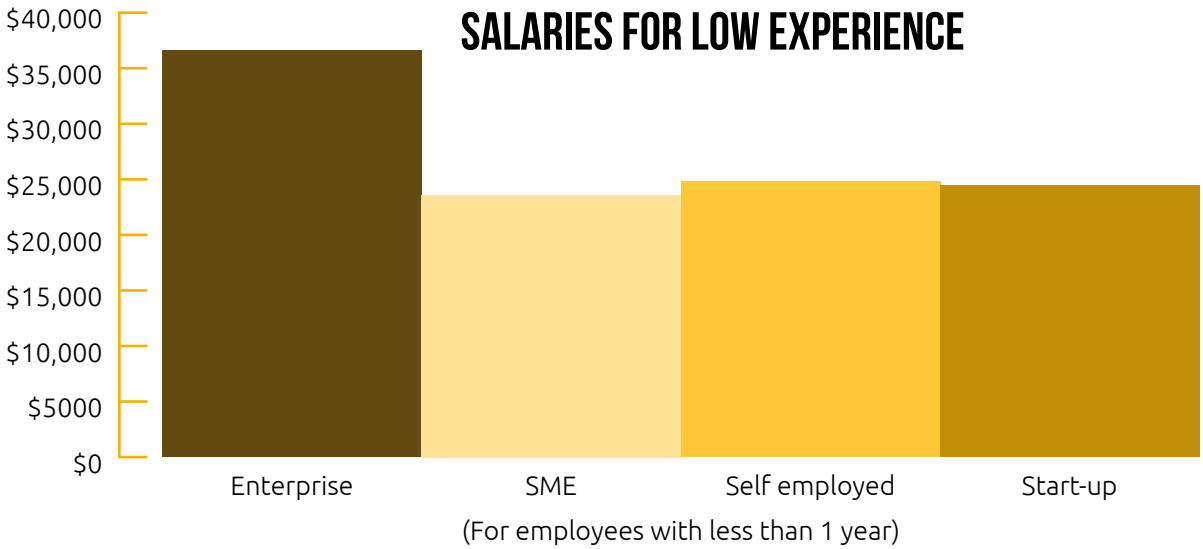
WHAT INDUSTRIES ARE BEST FOR WEB DEVELOPERS TO GET INTO?

Now we've seen the average wage of web developers, we also need to look at what industries are the best for developers. Here are the top industries by company type and their average salaries.



What if you're new to the industry? Would you be best going to an Enterprise company, making your own way, joining a start-up, or finding an SME?

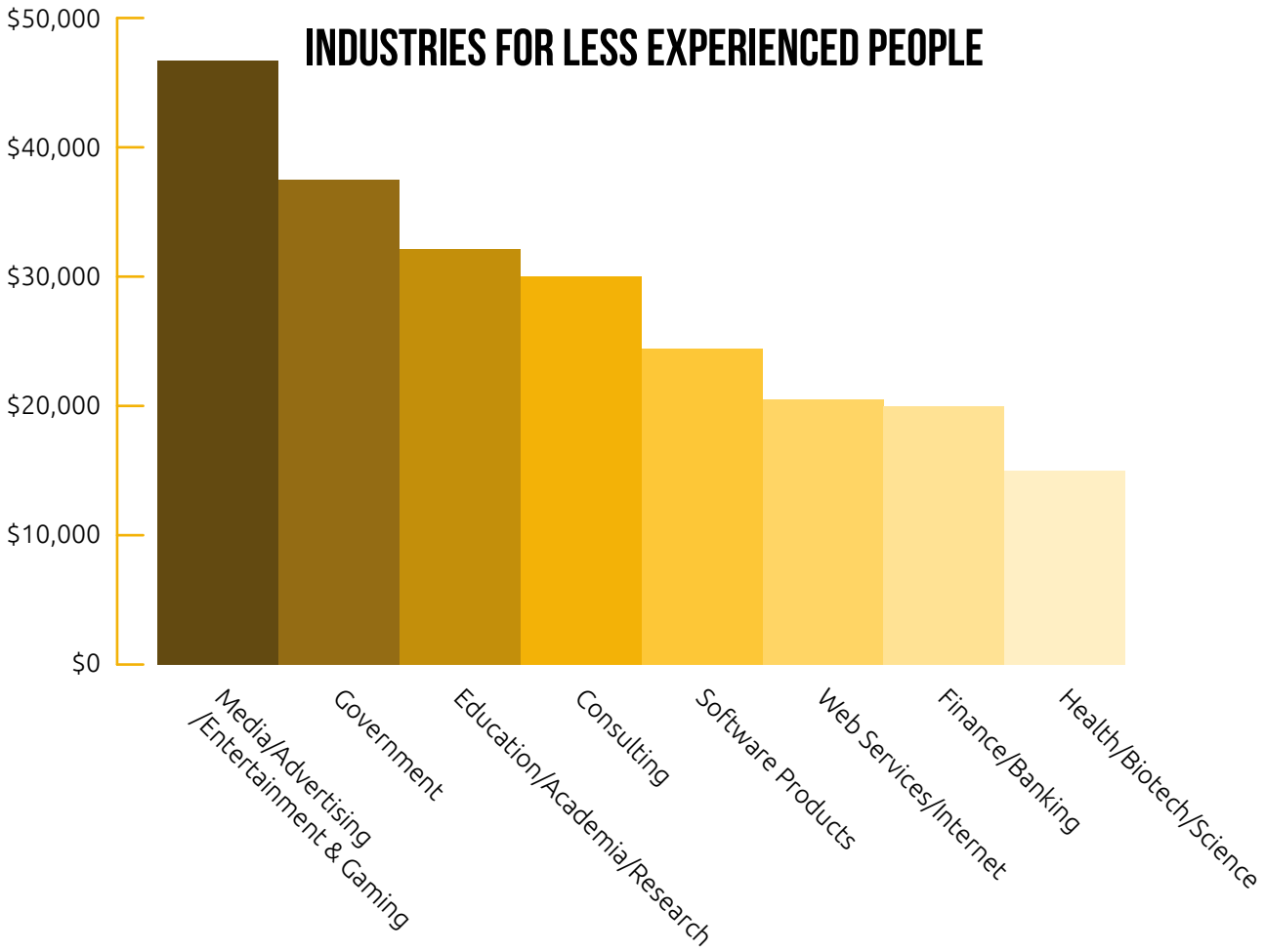
Let's compare the average salaries for less experienced people across company types and find out:



Summing up everything so far:

- Industrial sectors tend to pay very well.
- Start-ups in the Entertainment sector pay very well.
- Generally, SMEs are on a par with Enterprise companies for web workers.
- The Entertainment industry pays well for people with less experience, and offers a good proportion of roles at this level.
- Full-stack developers are incredibly valuable.

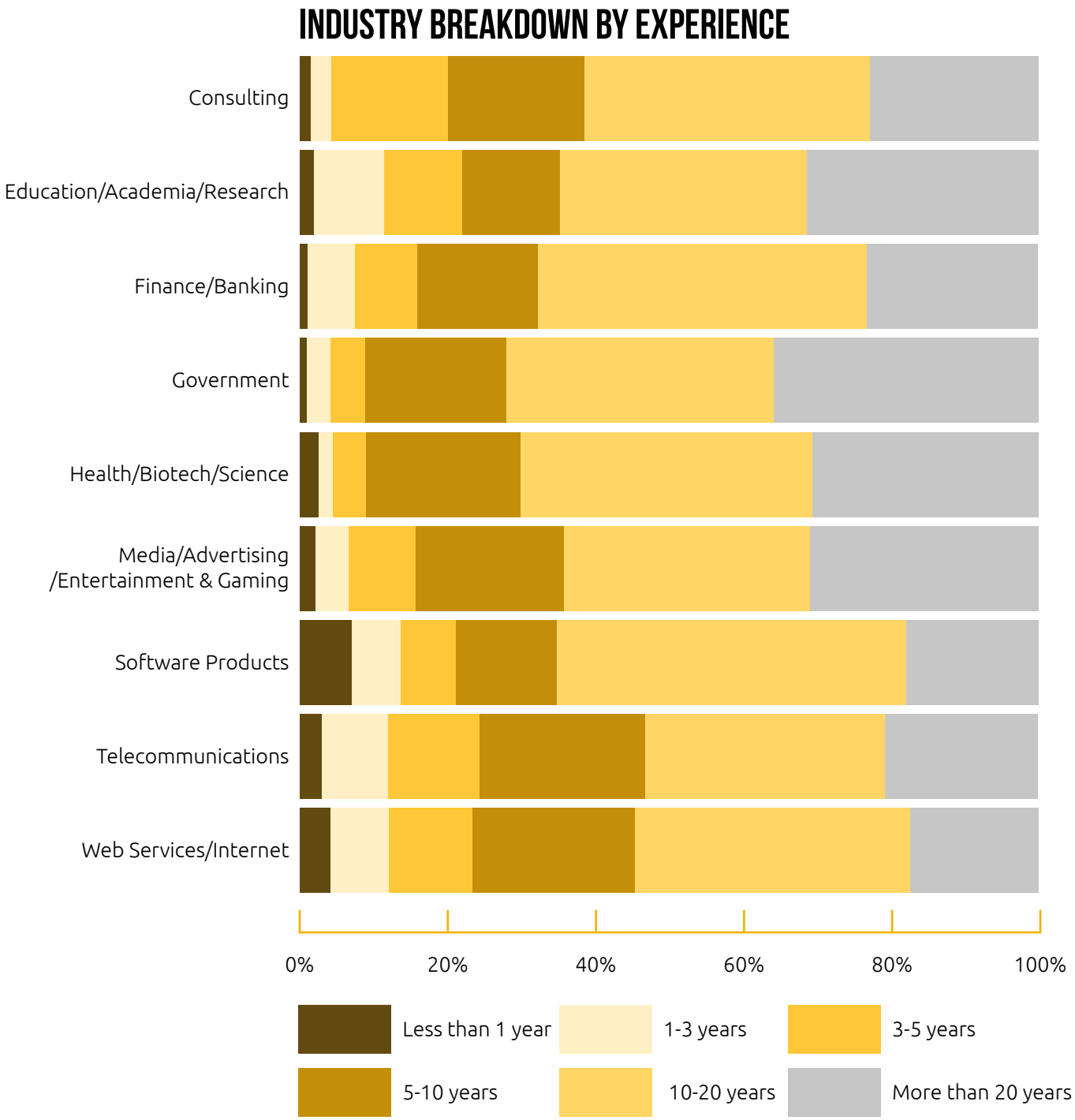
So Enterprise still tops all on average. What about industries? Which industry should you get into?



From these graphs we can draw two key conclusions:

- Working in the Entertainment industry has benefits.
- Working for a general web based company will, on average pay less.

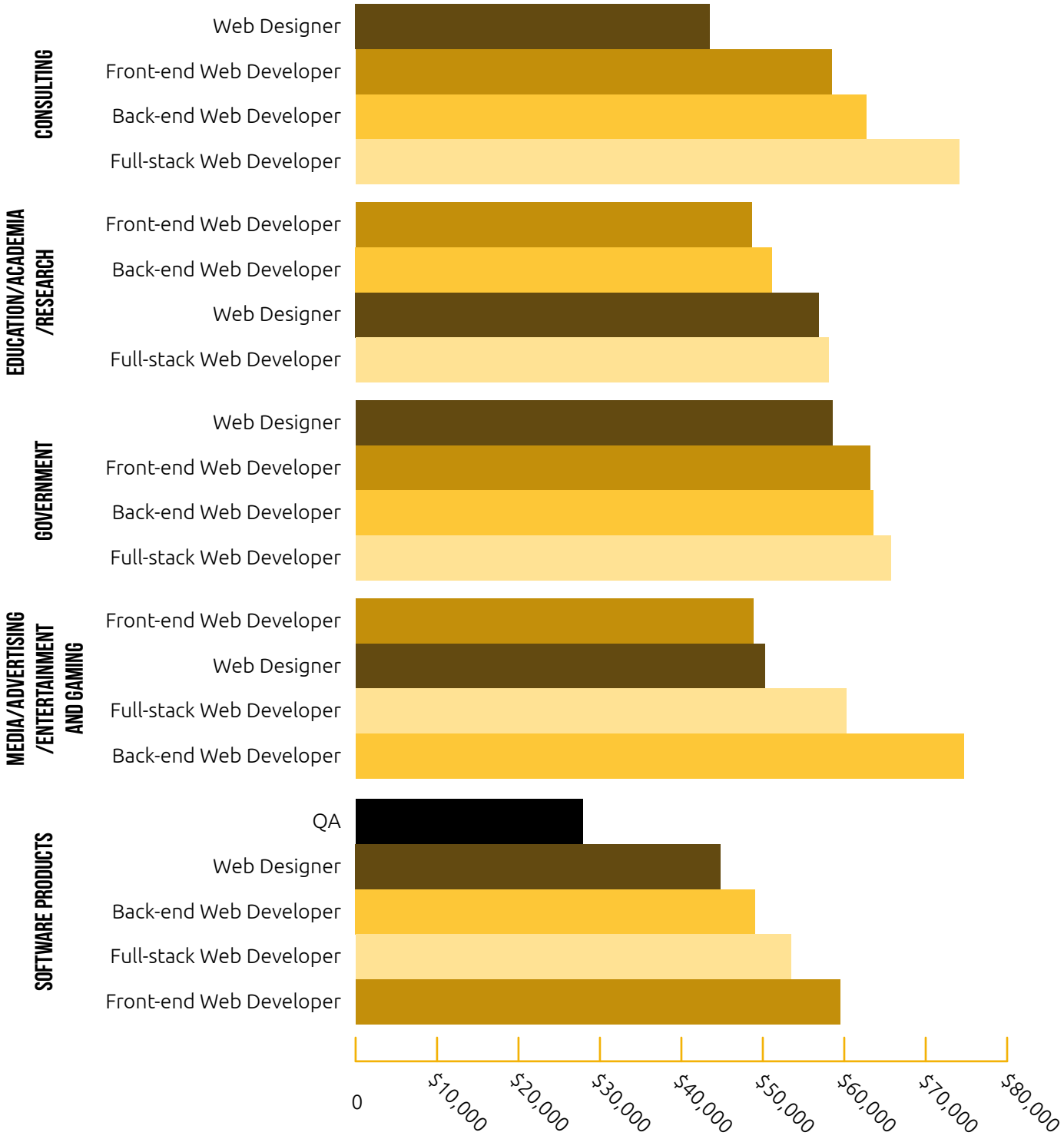
COMPETITION ACROSS INDUSTRIES



So all industries are still dominated by more experienced players, but again, Media/ Entertainment has a good proportion of less experienced people, and with the salaries offered, it seems like a good proposition (the opportunity to gain experience, as well as a variety of projects to work on too)!

Let's take a more detailed look at the populous industries and see what the average salary looks like across them.

AVERAGE SALARY BY COMPANY AND JOB ROLE



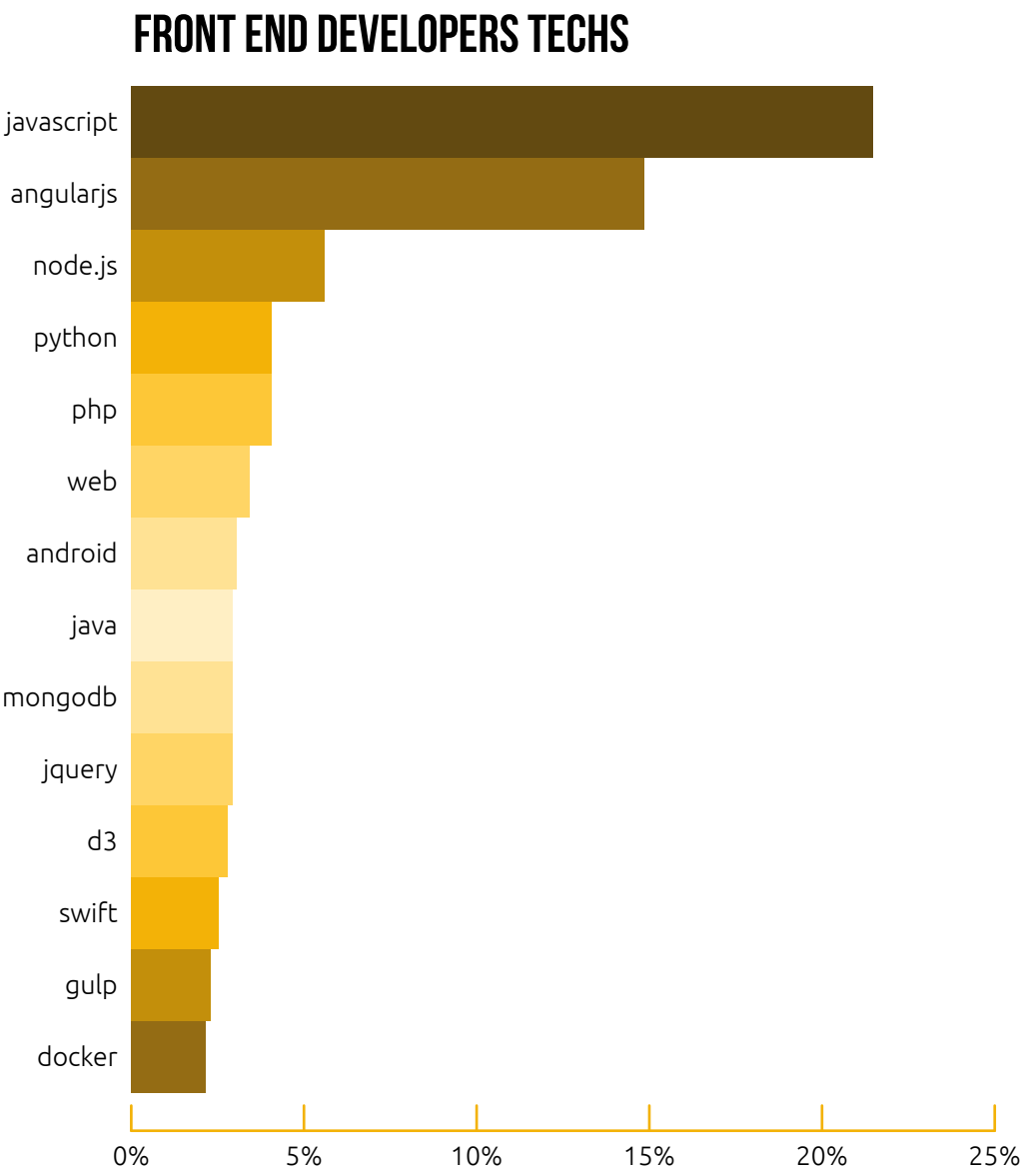
So, once again it pays on average to be a Full-stack Developer!

WHAT TECHNOLOGY ARE DEVELOPERS USING THE MOST?

Now we have a good breakdown of the various industries that make up the web development world, we can look at the next step, the technology. As a developer you need to not only know the skills that you are expected to use every day, but to have a good eye for the Next Big Thing, so you stand out from the rest of the crowd.

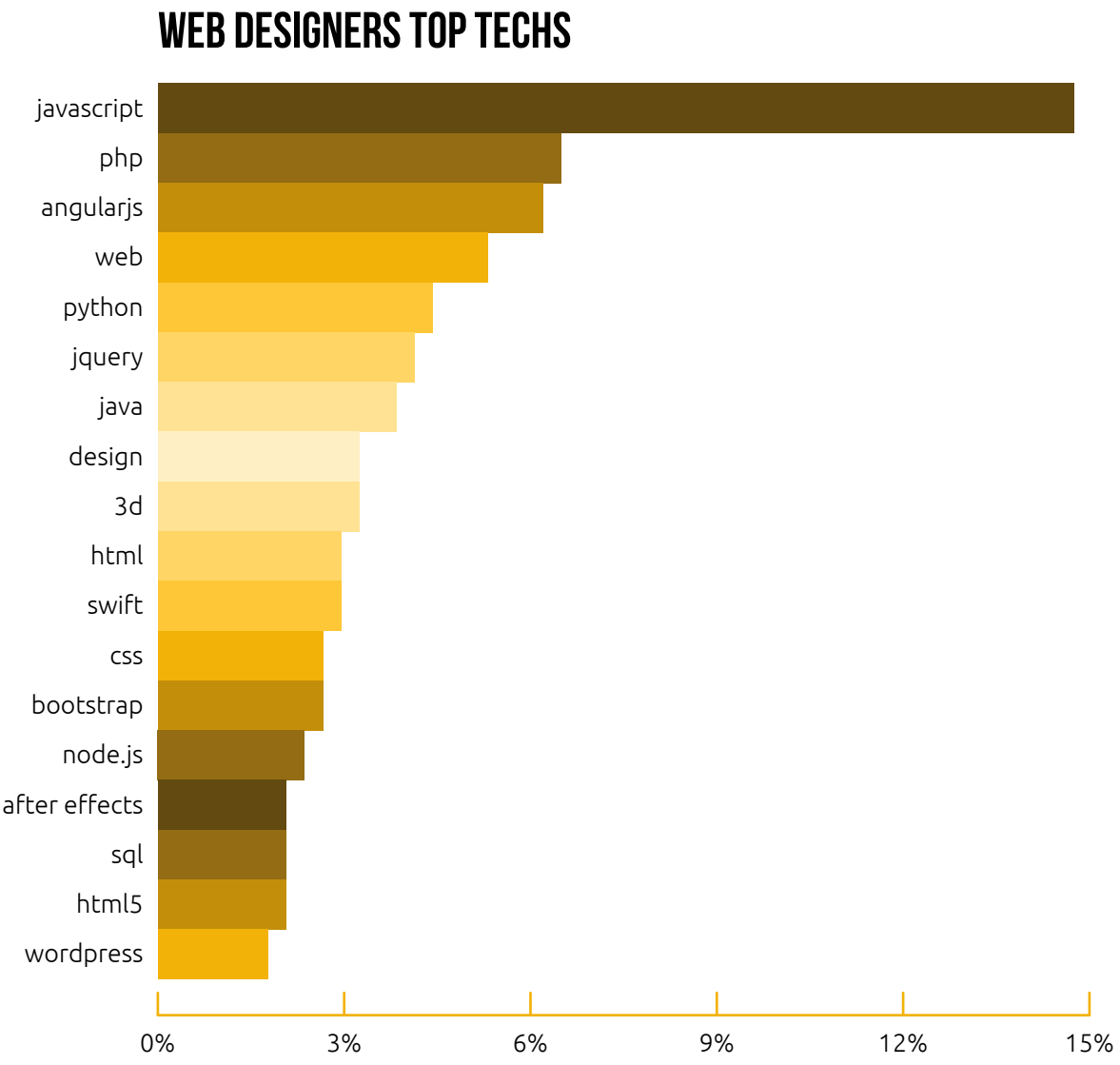
Let's start with current technologies. We asked all of our 6,000 web developer respondents 'What are people using on a daily basis?' Let's split these results into three graphs: Front-end, Back-end, and Full-stack Developers to get a better overview of the key skills in each category.

FRONT-END WEB DEVELOPERS



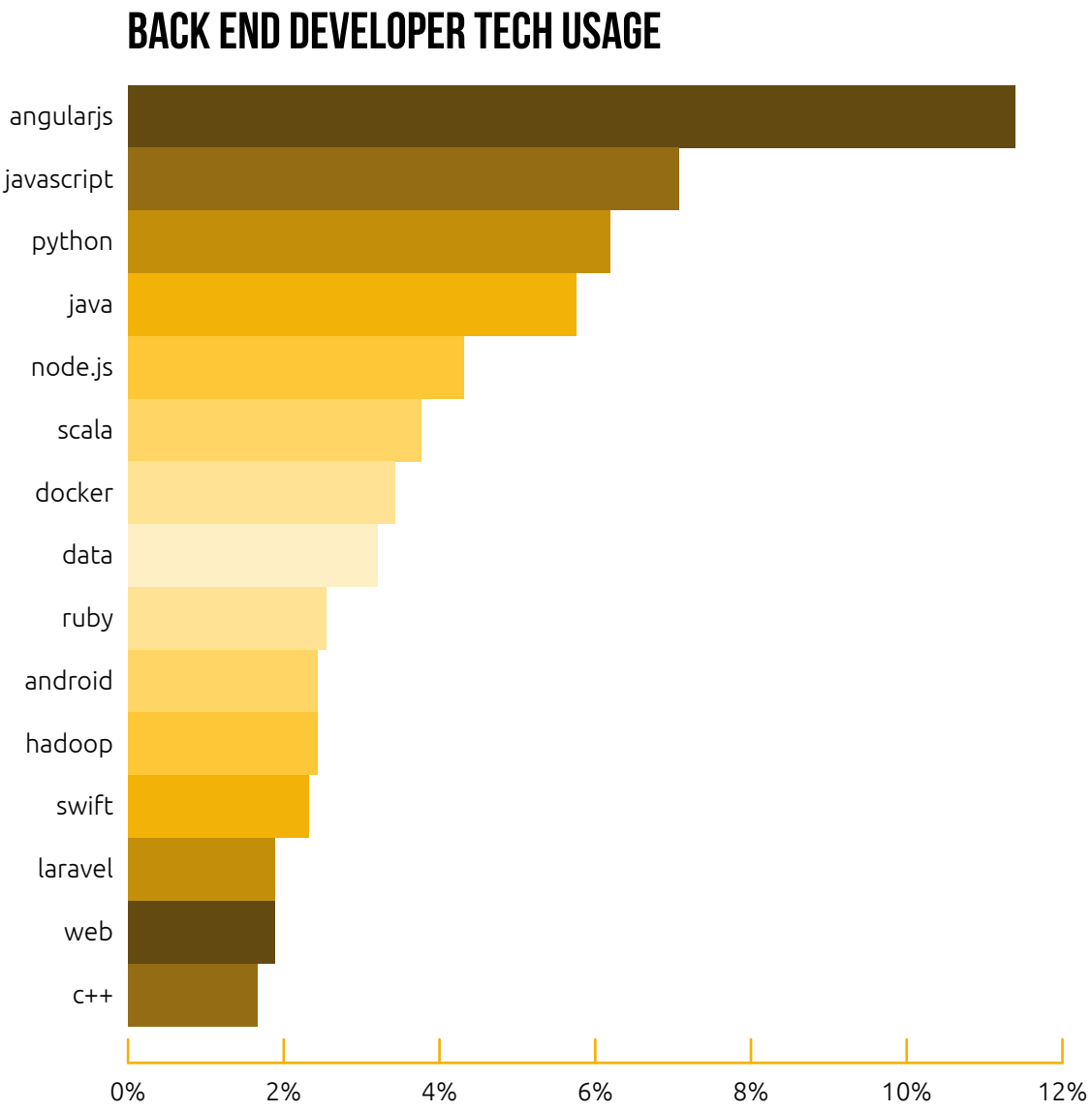
Not many surprises here! JavaScript, HTML, and CSS reign supreme; jQuery is also the most prevalent framework here, though Angular is following not far behind. Most surprising is the fact that PHP, despite many discussions on its future, is still used by over 20% of all our Front-end Developers!

WEB DESIGNERS



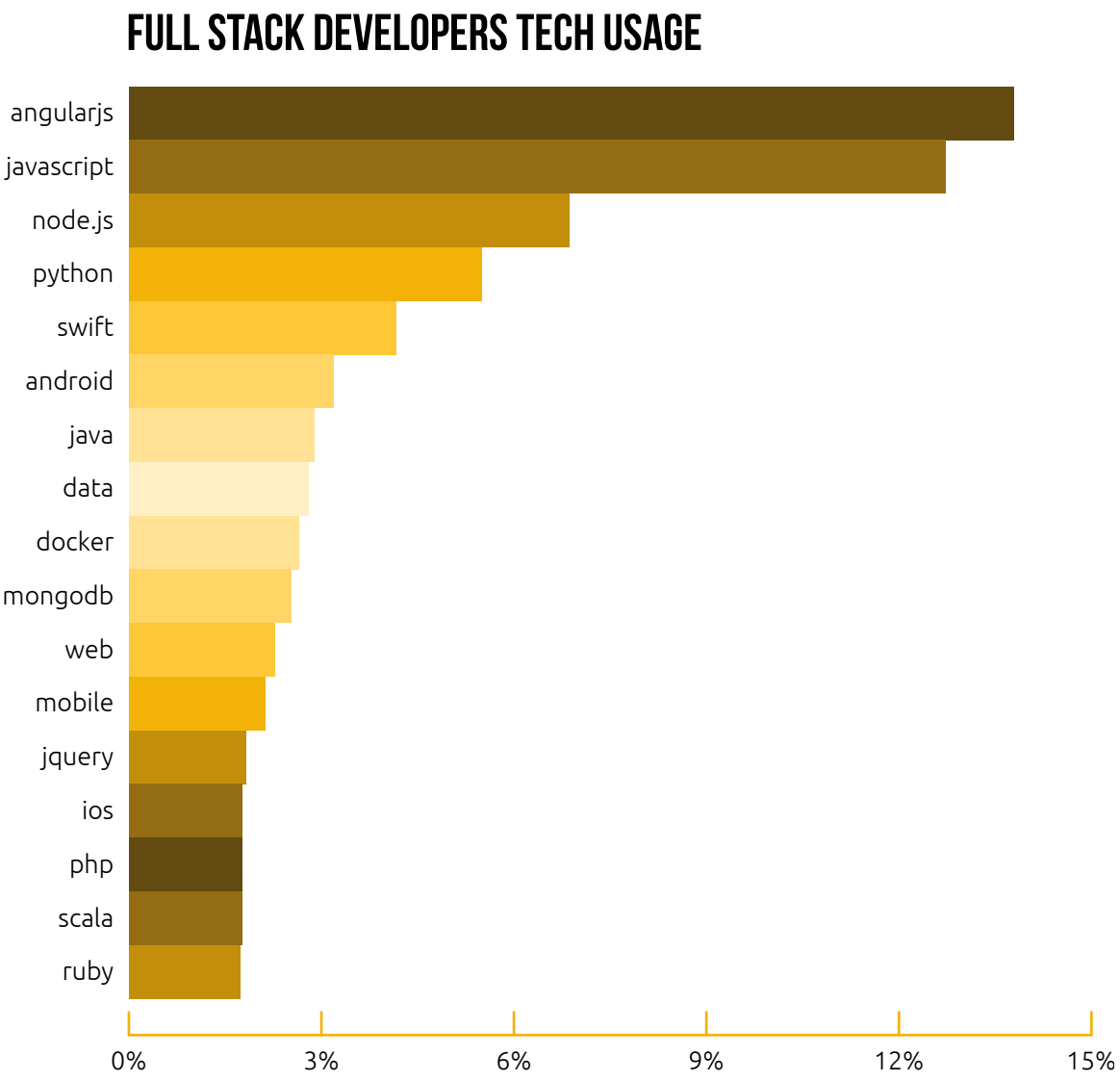
Another very obvious selection of technology here. An interesting trend however is the rise of Python. Frameworks such as Flask are becoming a great way for developers who know Python to hone their skills in the web developer world. It is likely that the percentage of Python users will only grow, as those frameworks become better known. Web development isn't just for JS users now!

BACK-END WEB DEVELOPERS



One of the most interesting selections of tech so far! Everything from Angular and Python to Node and JS are being used by our Back-end Developers. Lots of modern tech is being used by the majority too.

FULL-STACK WEB DEVELOPERS



Unsurprisingly, Full-stack Developers look like a combination of Front-end and Back-end Developers when it comes to the tech they use. Angular is dominant in the world of the Full-stack, though it's also interesting to see Python and Docker make an appearance too.

Listing tech by overall appearance is always going to be limited in this context as much of the interesting information lies in the bottom third of this graph. It is the small frameworks that are of most interest. We want to find out which tools you should look out for!

WEB DESIGNERS - TAG CLOUD

To find the common usage statistics from your responses, we put all the following results into a tag cloud and extracted the words, weighted by salary. The following word charts are the original results. These are the tools that the highest earners in this sector are using every day.

Unsurprisingly WordPress is still very much the top dog for Web Designers with its host of options for any design need. CMS systems like Drupal also make a large showing, and frameworks like Bootstrap and SASS are well represented for when designers want to make their work stand out, and bring in some modern design aspects.

FRONT-END DEVELOPERS - TAG CLOUD

A very obvious selection here, with established tools like Java and PHP coming up top, as well as a full panoply of JavaScript libraries for any situation.

BACK-END DEVELOPERS - TAG CLOUD

Lots of diverse languages featuring here, especially Python and Django which has gained traction over the last year. With NoSQL databases like Mongo, Memcached, and Redis also appearing, there's a good selection of technology for the aspiring Back-end Developer to look into.

Python and Django are some of the biggest names that appeared in our survey, and it's no wonder why, with flexible code to create powerful server-side apps. We've created a special Back-end Python bundle so you too can learn how to bring this great language into your toolkit, or even take your existing Python skills to the next level. The bundle has the following guides for all your back-end Python needs:

- Python Network Programming Cookbook
- Flask Framework Cookbook
- Web Development with Django Cookbook
- Django Essentials
- Learning Django Web Development

FULL-STACK DEVELOPERS - TAG CLOUD

A very interesting selection here, along with the really established tools we're seeing a full range of languages and packages. Developers seem to know what they like, and whether it's established or new, everything seems to be used, creating the perfect toolkit for developers.

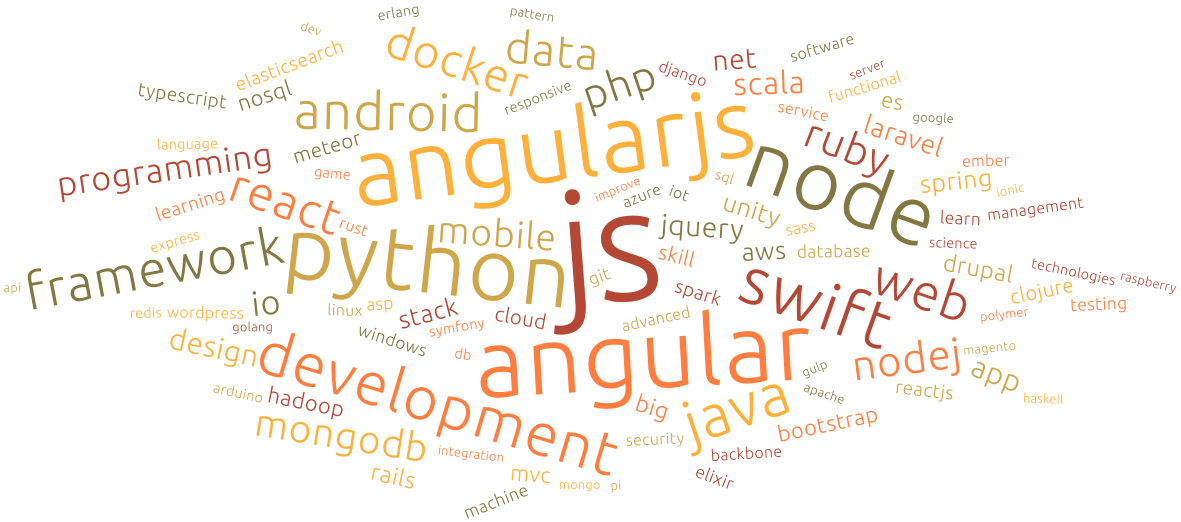
So with all this information what conclusions can we make from these graphs?

Well, for starters:

- As reported by our respondents, Angular is here to stay.
- Mobile development is at the forefront of everyone's minds as the world starts to interact with the web more and more on mobile devices.
- The Internet of Things is poised to change how we interact with the world, and how the world interacts back!

WHAT COMES NEXT?

Now we know what skills and tools are used every day, we asked what technologies our respondents were planning to learn over the next 6 months. The tag cloud below is based on your responses and is weighted by frequency overall:



A lot of interesting ideas from these results:

- Angular is basically poised to be everywhere.
- New languages seem to be the main focus outside of Angular. Python, Swift, Java, and even Scala feature here.
- Lots of mobile technologies are mentioned, which continues to support the notion that mobile is going to be very hard to ignore.
- Docker is going to be one of the bigger new additions to a developer's toolkit in the coming months.
- React is making several appearances as it begins to gain prominence.
- Lots of NoSQL databases feature too, as well (Redis, Mongo, Neo4j).

We think it's pretty obvious from these results that Angular is the essential tool for all developers right now, so it's a great time to Get Going with Angular.

If it's going to be everywhere, then make sure you have the skills needed to make the most of it. Start creating great apps with our Angular bundle:

- AngularJS by Example
- AngularJS Web Application Development Cookbook
- Mastering Web Application Development with AngularJS
- AngularJS Web Application Development Blueprints
- AngularJS UI Development

WHAT IS THE HOTTEST THING COMING UP IN THE NEXT 12 MONTHS?

We asked what you thought would be the Next Big Thing in 2015-16. Would it be a rise in Cloud development, perhaps a new language or maybe a new paradigm?

Here's how you responded, again, weighted by salaries:

Interestingly, 'software containerization systems' came out on top. Many other container systems appear in the tag cloud as well. If we dig deeper into the results we can draw the following conclusions:

- Mobile is overwhelmingly on top.
- Internet of Things is poised to change how the web interacts with the consumer.
- Microservices also make quite a large appearance.
- Native JS outside of the browser seems to be what many developers see as one of the hottest things this time next year.

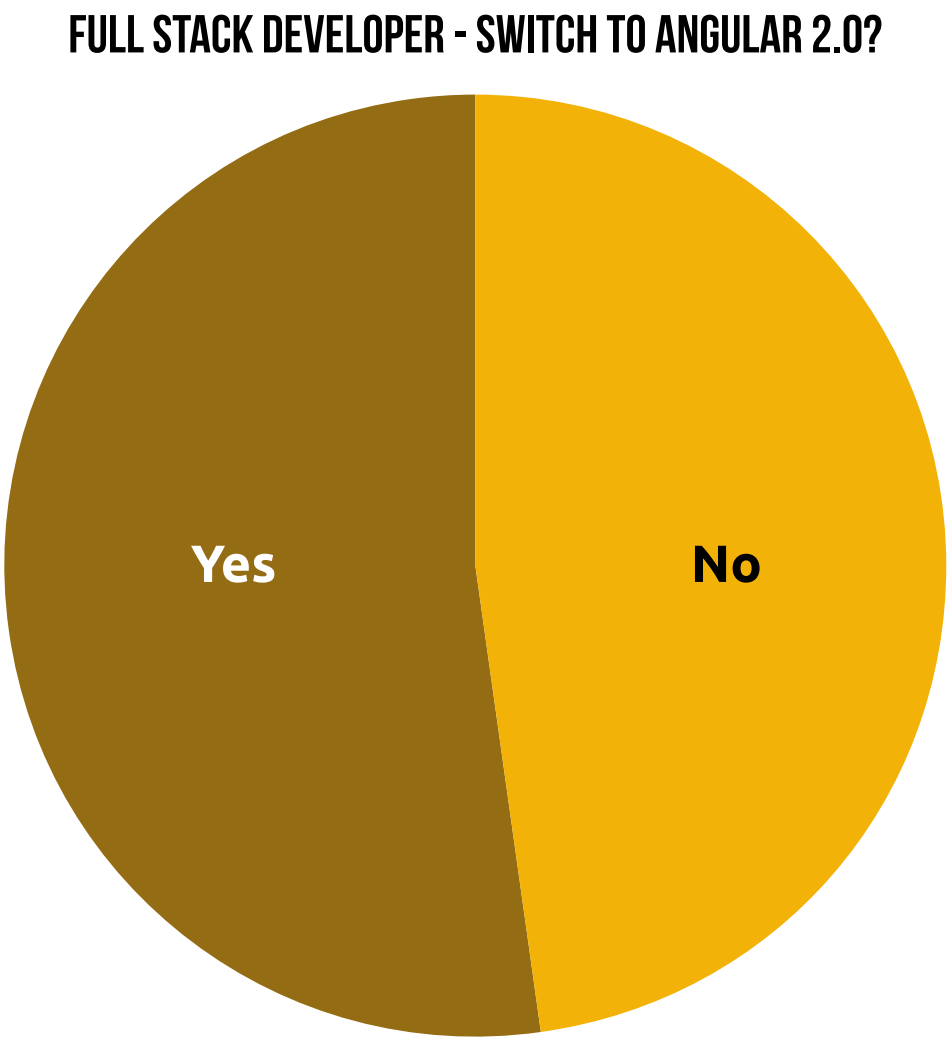
So it seems that multi-functional code and practices are the direction the Web Developer world will move towards over the coming year. Given the number of new and hot technologies on the horizon, with React and web components gaining ground it should be an exciting year!

HOT TOPIC ANALYSIS

To finish our survey we asked about the more interesting emerging trends in the ever-widening world of the web.

The first trend on the horizon was Angular 2.0. With it being so different to the Angular that developers know and love, would it be worth switching over?

The results are quite interesting…

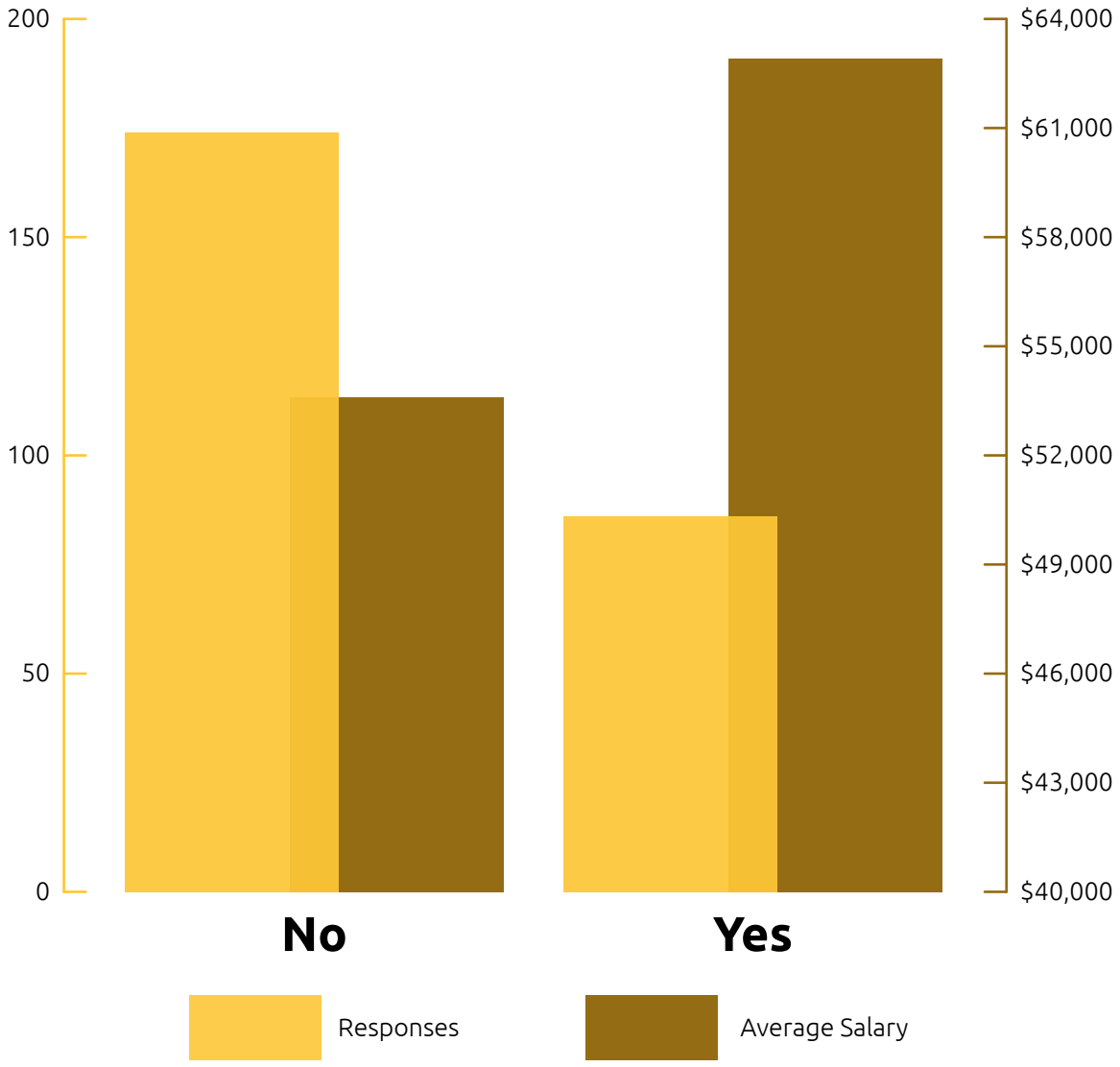


It's a tentative 'Yes' overall, though it seems many developers would like to see what it really offers, waiting for a few months after its release before deciding if they want to take the time to get to grips with its myriad of features. It's interesting to know that the 'Yes' is a lot more concrete when limited to just Full-stack Developers, as you can see above.

DO YOU THINK REACTJS WILL OVER-TAKE ANGULAR AS THE JS FRAMEWORK OF CHOICE IN 2015?

2015 is shaping up as Google and Facebook go head to head with Angular vs React. We asked our developers if they thought React would be able to take over the grip that Angular has on the web developer world.

Here are the results:

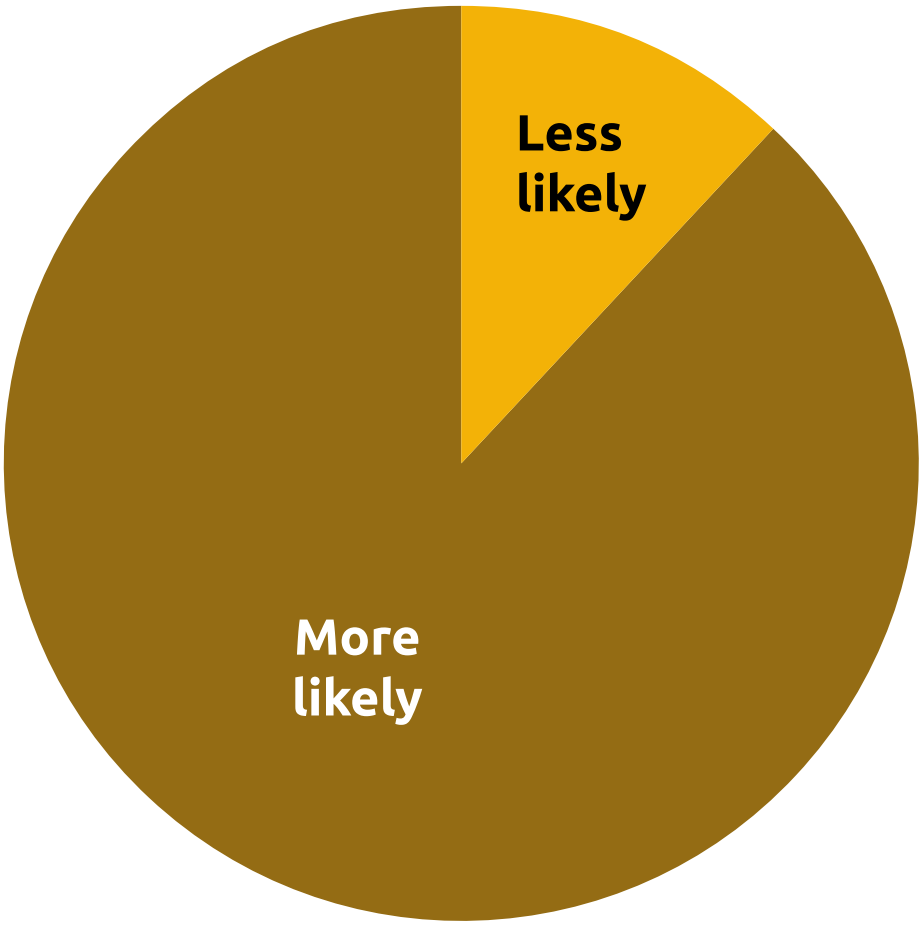


Across our entire cohort… it's a 'No'!

Limiting it to the Full-stack Developers' response, it's still a 'No', however those responding 'Yes' are earning on average $10k more. Perhaps they know the real score?

HAS THE RECENTLY ANNOUNCED MERGER BETWEEN IO.JS AND NODE.JS MADE YOU MORE OR LESS LIKELY TO USE NODE IN THE FUTURE?

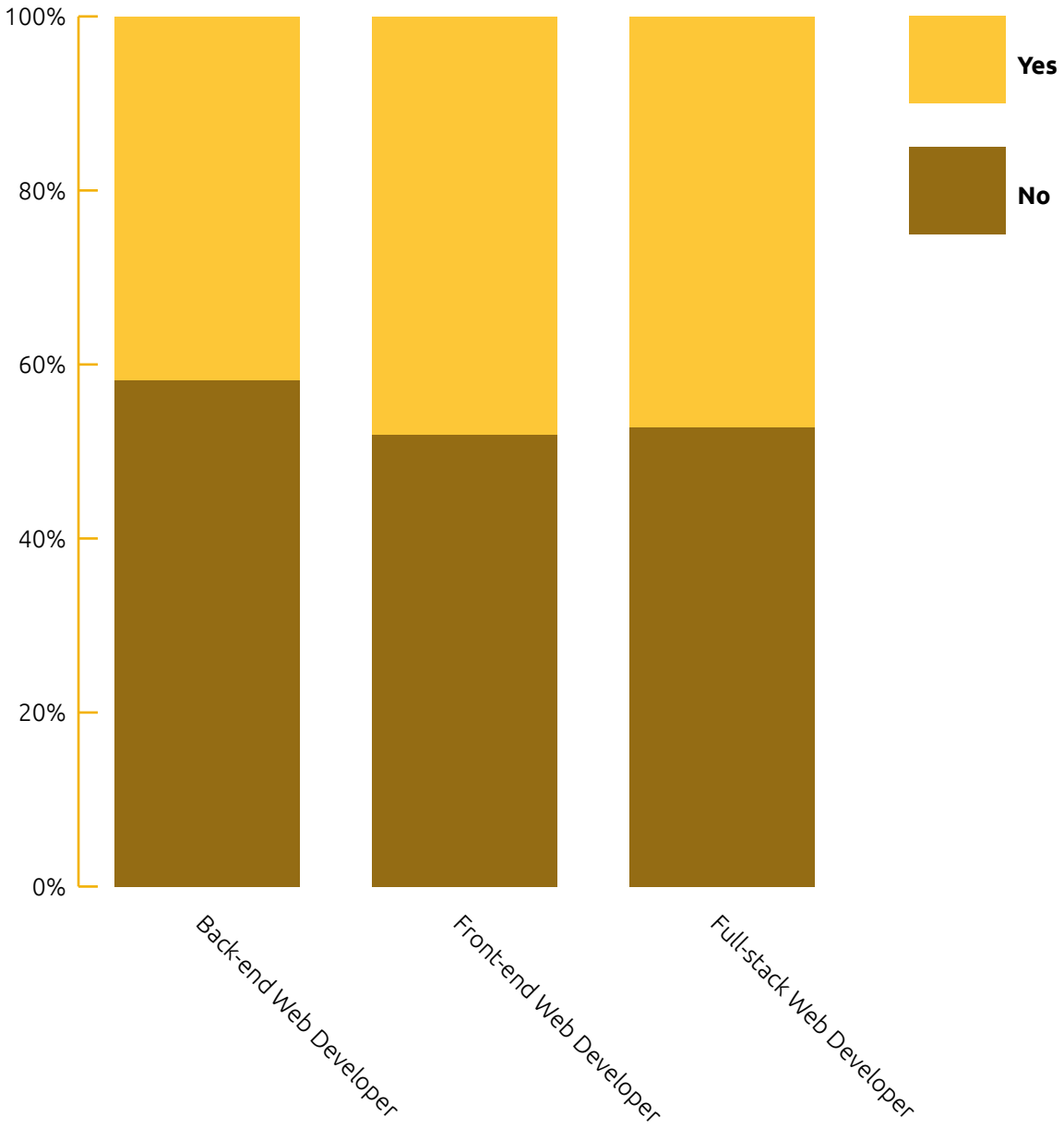
With io.js and Node once again joining together we asked you all whether you were more interested in using Node or not. In the end, did the merger make the final product stronger?



The answer? Well, it's a resounding 'Yes'!

DO YOU AGREE WITH THE ASSERTION THAT JAVASCRIPT HAS WON THE BATTLE AGAINST PHP FOR THE SERVER SIDE SCRIPTING LANGUAGE OF CHOICE?

It seems every few months PHP is declared dead and another language will rule the back-end scripting. Full-stack development has grown over the last year so we asked whether you thought the battle was well and truly over.



So it appears that the battle will still be waged for some time. Our respondents were evenly split, though unsurprisingly Back-end Developers are more likely to believe PHP is very much alive and well. It looks like everyone will have to wait a while longer before we stop seeing this conversation pop up!

ARE YOU ALREADY USING ECMASCRIPT 6 IN PRODUCTION?

This question led to a resounding 'No' across the board, though not surprisingly, considering the standard for 6 was only finalized a few weeks ago. It will be interesting to see how this changes over the coming months! For now though, just like Python 2.7, ECMAScript 5 is here for a while yet.

DO YOU PLAN ON USING WEB COMPONENTS IN THE FUTURE?

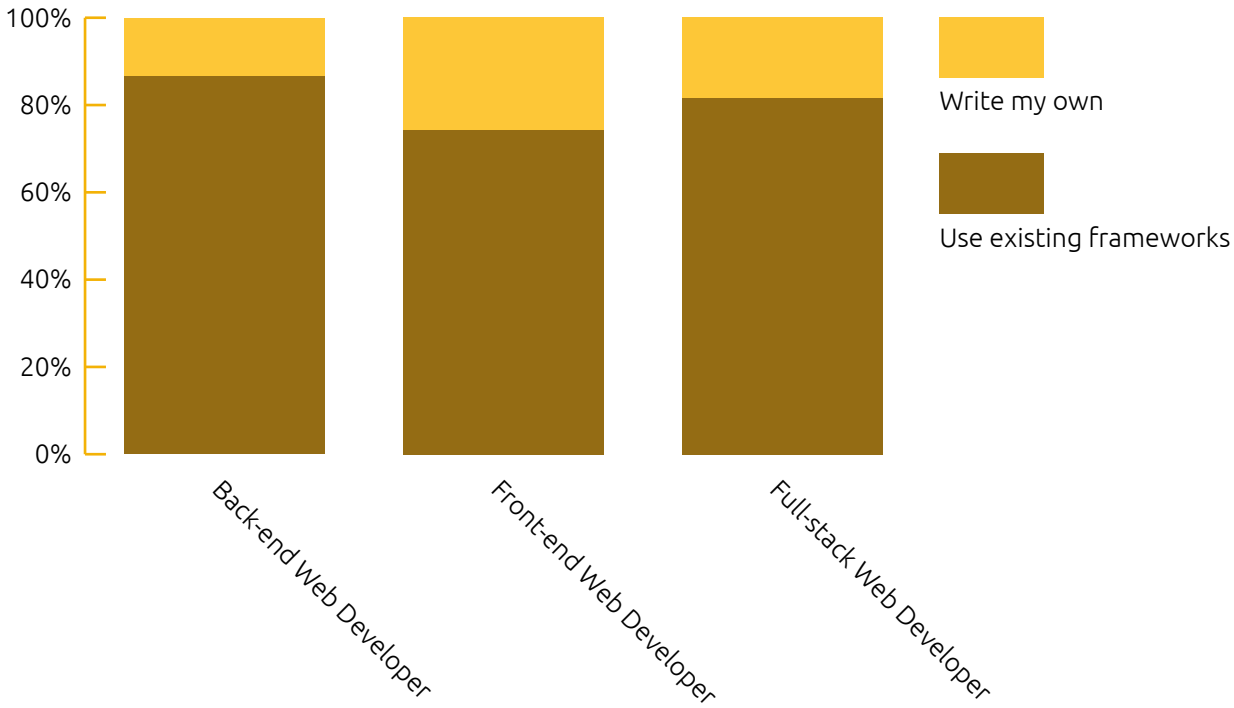
A resounding 'Yes', with 90% of our respondents planning to use web components. Excitingly, web components have the potential to be The Next Big Thing in web development. With Polymer 1.0 officially released more people will use web components; there may even be universal adoption!

But why wait to use web components when you can use them right now? Don't be left behind, grab our Ready for the Future bundle, which features great books and videos on the hottest and newest web developments:

- Learning Web Component Development
- Mastering CSS [Video]
- Meteor Cookbook
- Node.js By Example
- WebSocket Essentials

AND FINALLY

Overwhelmingly, people see the wisdom of using pre-existing frameworks, compared to writing their own. Saving time for what needs to be done, some developers seem to write their own when looking for something special, that's not readily available in the marketplace.



WHAT'S NEXT?

After everything this survey has uncovered in the world of web developers and designers, what they use, what they want to learn, and what they think will be the biggest developments in the next year, what can you do as a developer?

- New options in technology have opened up a world of possibilities. Do you know JavaScript? Why not learn Python and see if you prefer it instead? What about the same language but a new paradigm? Packt can help with a host of languages when you are ready to try a different way to code.
- With a new language, a host of new frameworks open up too. Flask, Django, Bootstrap, Angular, and React. Each one brings a host of different benefits for different situations.
- The future's bright in the web developer world. Docker, the Cloud, Native and JavaScript outside your browser, and even web components are changing how we develop applications. If you're interested but don't know where to start then try out our Ready for the Future bundle.
- Full-stack currently has the best of both worlds when it comes to options, so maybe it's time to look at the half of the web development world you're missing out on? Our Full-stack bundle is a great place to start.

No matter what path you choose in the world of web development many options are open for you. Our range of books and videos means you have the support you need to make sure you can make full use of your own skills!

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HELPING IT PROFESSIONALS TO PUT SOFTWARE TO WORK IN NEW WAYS

Founded in 2004 in Birmingham, UK, Packt's mission is to help the world put software to work in new ways, through the delivery of effective learning and information services to IT professionals.

Working towards that vision, we have published over 3000 books and videos so far, providing IT professionals with the actionable knowledge they need to get the job done –whether that's specific learning on an emerging technology or optimizing key skills in more established tools.

As part of our mission, we have also awarded over $1,000,000 through our Open Source Project Royalty scheme, helping numerous projects become household names along the way.

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