ANALYTICS & BIG DATA SALARY REPORT 2016

A complete rundown of pay packages in the Indian industry

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INTRODUCTION
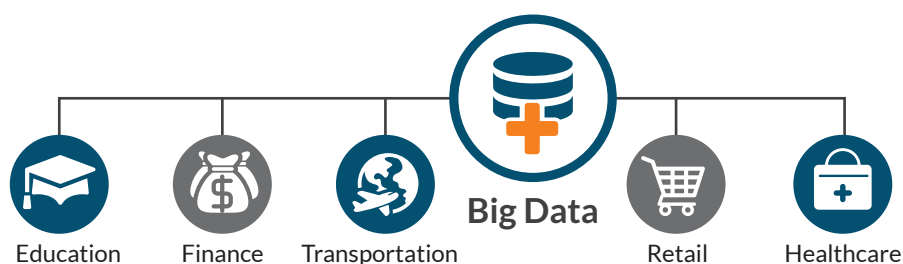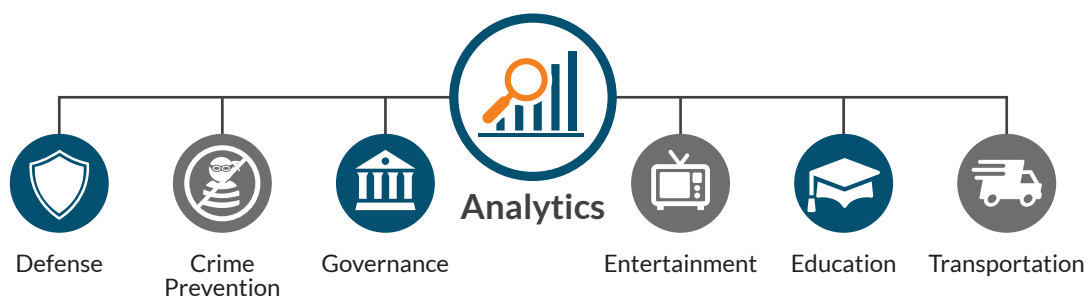
- By Gaurav Vohra, CEO, Jigsaw Academy

Growth in 2015

The Analytics & Big Data sector has seen consistent growth in the last five years despite an increasingly uncertain global outlook. The advanced analytics market is expected to grow at a CAGR of 33.2% and Big Data at a CAGR of 26.4%, almost six to eight times that of the overall IT markets.

Impact on businesses

Analytics & Big Data have revolutionised the way business is done around the world. All companies, no matter what size, rely on data and analytics to make critical business decisions. From understanding consumer behaviour to predicting market trends, even right down to product features, many moves are driven by analytics and data in companies across the world.

Today, Analytics is most used in

| Defense | Crime Prevention | Governance | **Analytics** | Entertainment | Education | Transportation |

| Education | Finance | Transportation | **Big Data** | Retail | Healthcare |

Leading by example

Two of the most famous companies in the world use analytics and Big Data to shape their product, services and delivery - **Amazon** and **Facebook.**

Both companies have changed the way consumers use the internet.

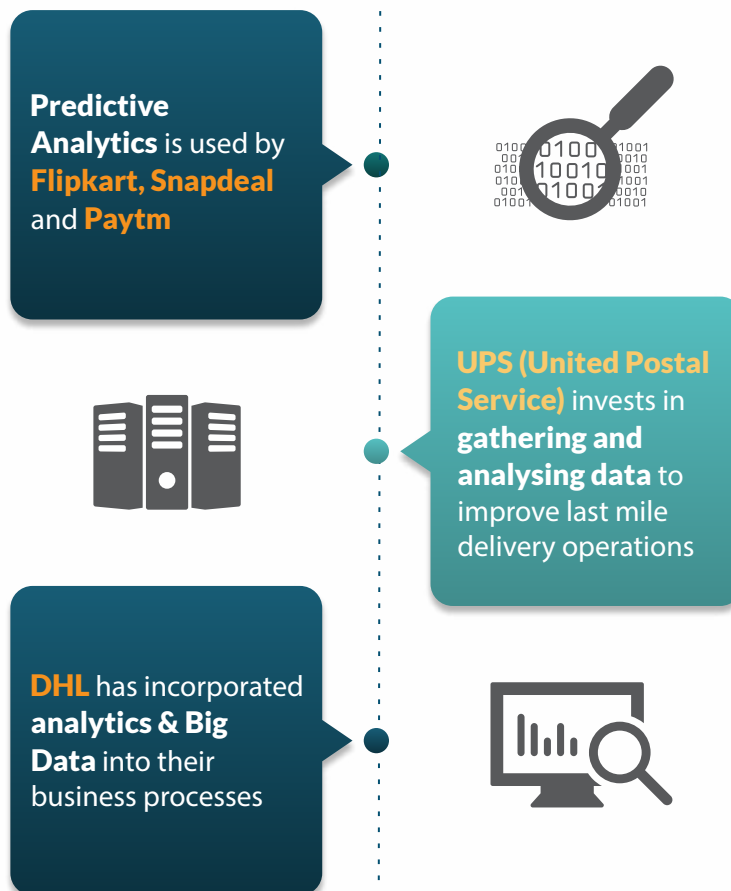Amazon uses analytics to curate products on their customers' homepages based on their previous purchases and browsing habits.

Facebook uses analytics to fill your news feed with updates from people you interact with the most; content from sites you frequent and products you have checked out on other sites.

Needless to say, if you found this report online, it's because analytics & Big Data made it possible.

Predictive Analytics is used by **Flipkart, Snapdeal** and **Paytm**

UPS (United Postal Service) invests in **gathering and analysing data** to improve last mile delivery operations

DHL has incorporated **analytics & Big Data** into their business processes

Hiring trends

The days of specialists in one tool or domain are gone. Companies today are looking for employees who know how to use the entire tool set of analytics & Big Data. This year, we found that people who know R and Python command a premium.

Educational qualifications required for data science have also seen a shift. Just a Masters or a Phd on your CV is no longer impressing companies today. They want people who have the business acumen or at least business knowledge and understanding of analytics. This means you don't just need an MBA, you also need to know analytics to get that job.

EXECUTIVE SUMMARY

R, a crowd pleaser, remains the front-runner in the analytics race, though Python is hot on its heels. That said, the more varied your skill set, the more you earn.

R

SAS+SPSS + R + Python

Python

Big Data + Data Science

Analysts skilled in both Big Data and Data Science are being snapped up at the highest salaries.

Kolkata

Surprisingly, the best city to be an analyst in is inexpensive Kolkata.

SAS

SQL

R
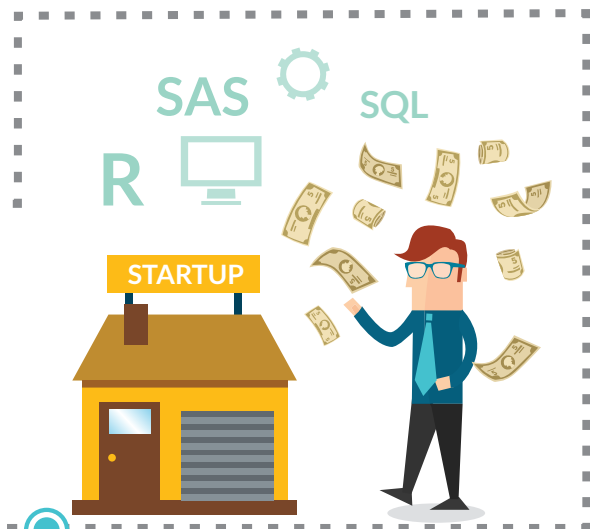
STARTUP

Cash-strapped startups spend money on their star analysts but when it comes to tools, they prefer to use open-source ones like R.

$

5 YEARS

Analysts can expect an astronomical increase in their earnings once they cross the 5-year mark.

NOTE FROM
THE CEO OF
ANALYTICS VIDHYA

There has been no better time to be a data science professional. With increasing data being generated and collected by various companies, the demand for talent is greater than ever. And this is just the beginning.

We are in phase 1 of what I call the 'data wave', where companies are creating their own databases / data warehouses / data lakes, data models, and predictive models.
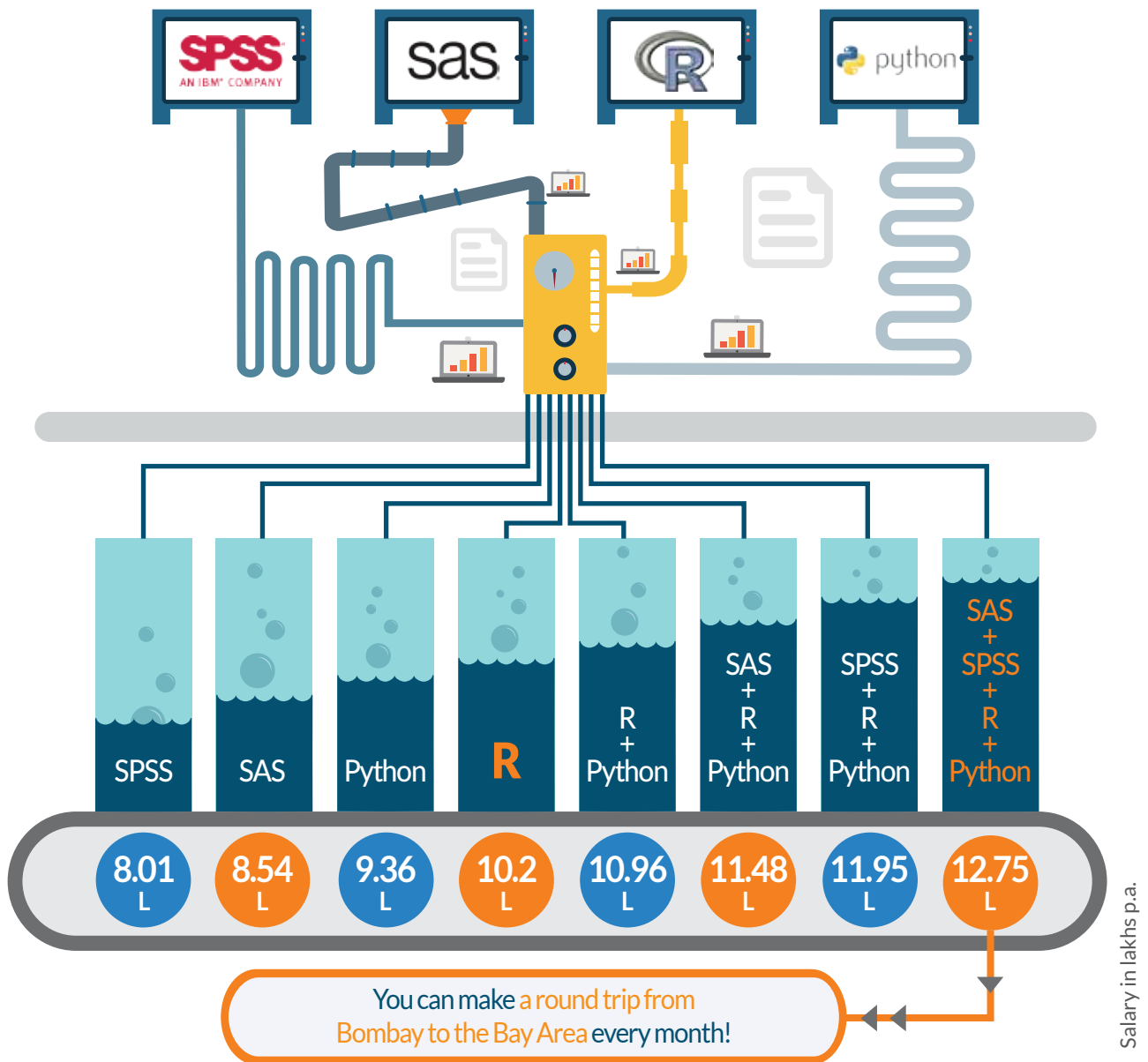
The next phases of this wave will see an influx of plug and play data products. As the difference between software or app development and data science start to blur, we will start to see the need for 'full stack data developers' emerging in the industry.

At Analytics Vidhya, we have interacted with more than a million data science professionals in the last one year and we will continue to analyze important trends in the industry. This groundbreaking study was conducted with over 60,000 analytics professionals. We are extremely excited about releasing some of these insights to a larger audience, and hope to help more and more people choose a fulfilling career in the wonderful world of analytics & Big Data.

- Kunal Jain

SALARY SPREAD BY TOOLS

SPSS	SAS	Python	R	R + Python	SAS + R + Python	SPSS + R + Python	SAS + SPSS + R + Python
8.01 L	8.54 L	9.36 L	10.2 L	10.96 L	11.48 L	11.95 L	12.75 L

You can make a round trip from Bombay to the Bay Area every month!

Salary in lakhs p.a.

R skills pay the most and are used the most. But relying on just one tool is not going to cut it, as the data shows that the highest salaries are paid to analysts who know more than just R or Python.

Even in multitool skill sets, combinations that include R and Python are best paid.

The highest recorded salary for 2015 - 2016 is 12.75 lakhs p.a. for analysts with the knowledge of SPSS + SAS + R + Python.
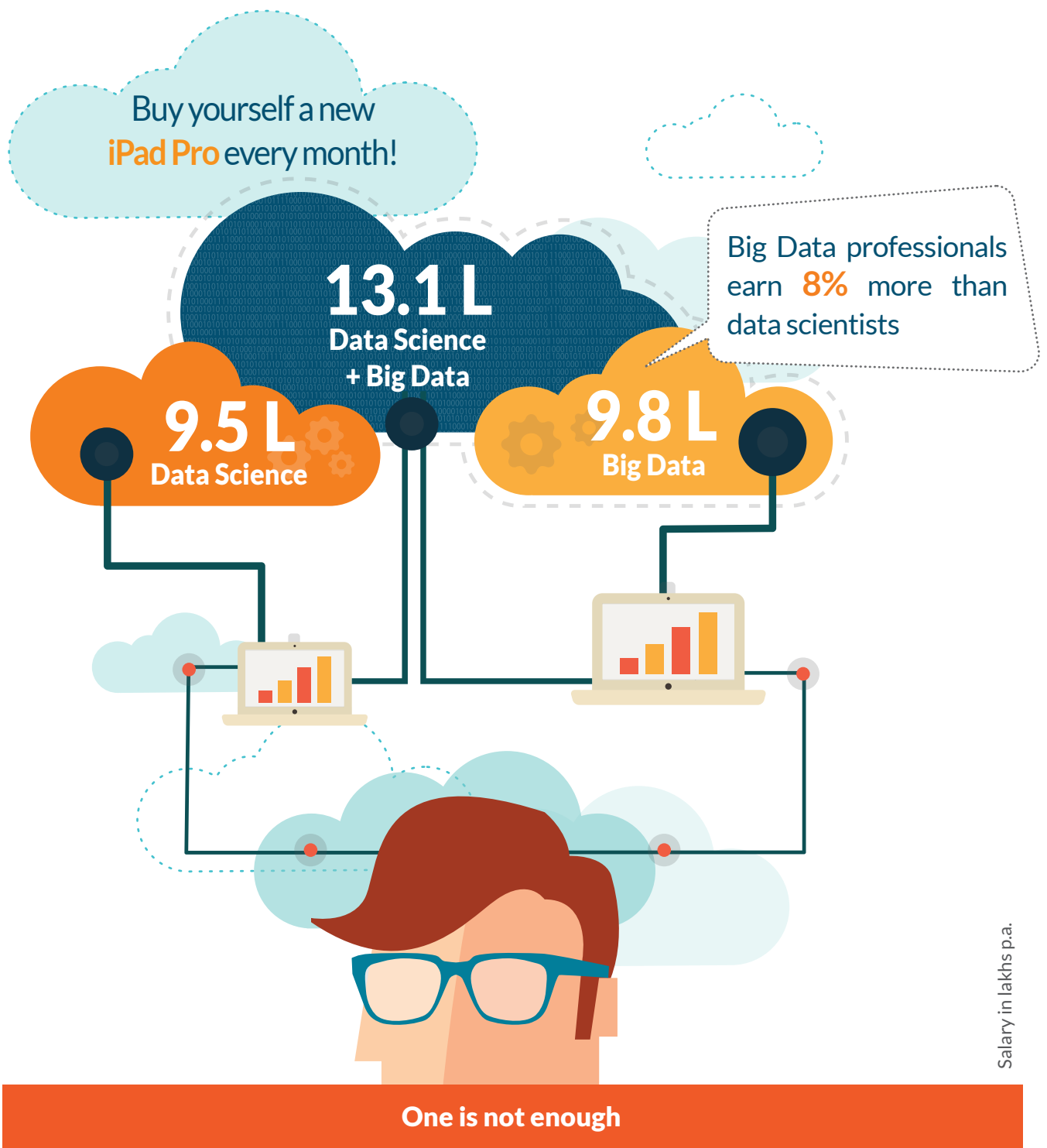
Learn more to earn more

SALARY SPREAD BY TECH
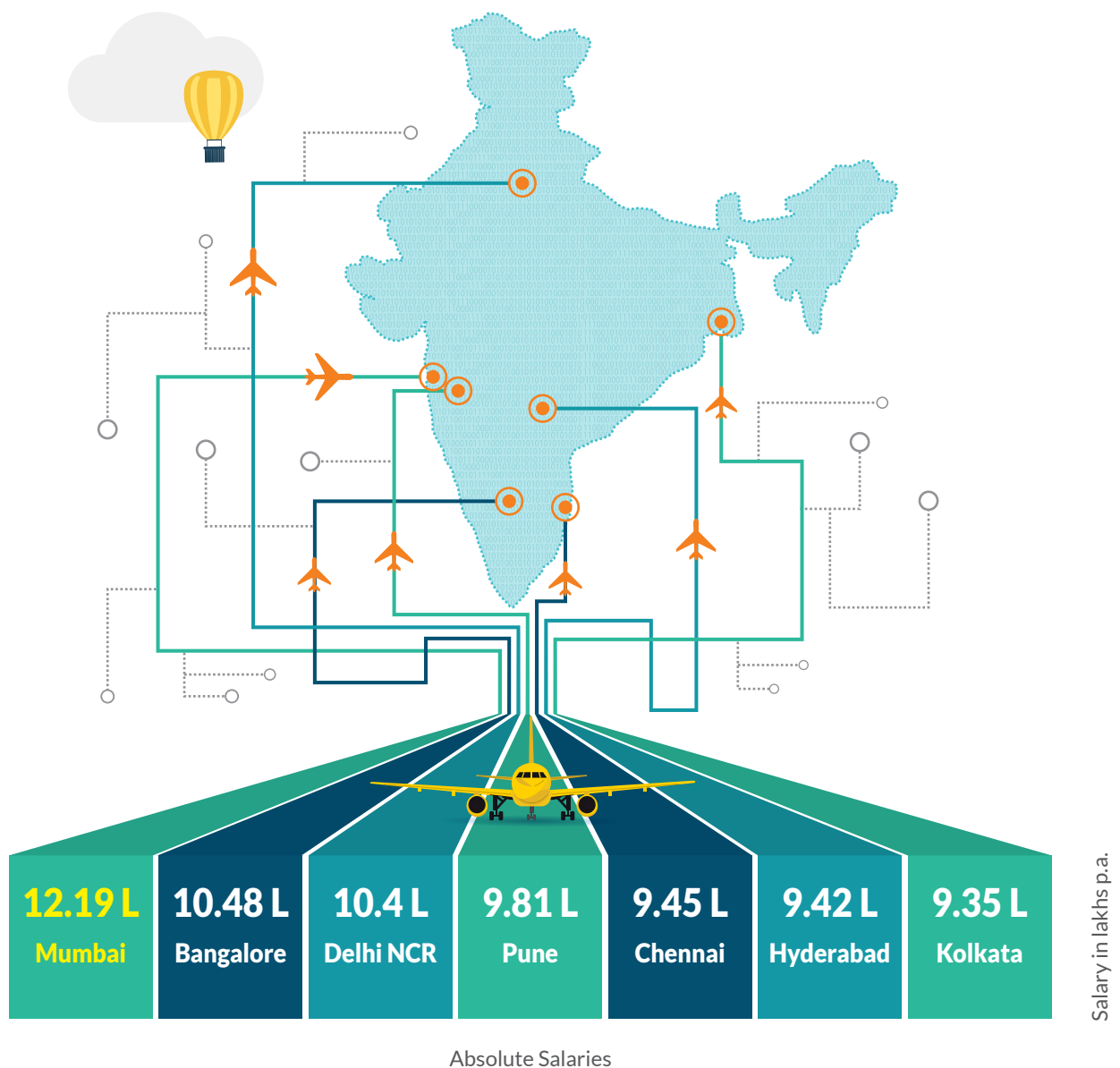
The power of Big Data is strong with this one.

Although Big Data professionals do earn 8% more than the data scientists, the larger payout is in knowing how to work with both - data science & Big Data technologies. To be precise, we mean 26% more.

Buy yourself a new **iPad Pro** every month!

13.1 L
Data Science + Big Data

Big Data professionals earn **8%** more than data scientists

9.5 L
Data Science

9.8 L
Big Data

Salary in lakhs p.a.

One is not enough

SALARY SPREAD BY CITY

Mumbai pays the highest among all cities in absolute numbers at 12.19 lakhs p.a. but it is also the most expensive city to live in.
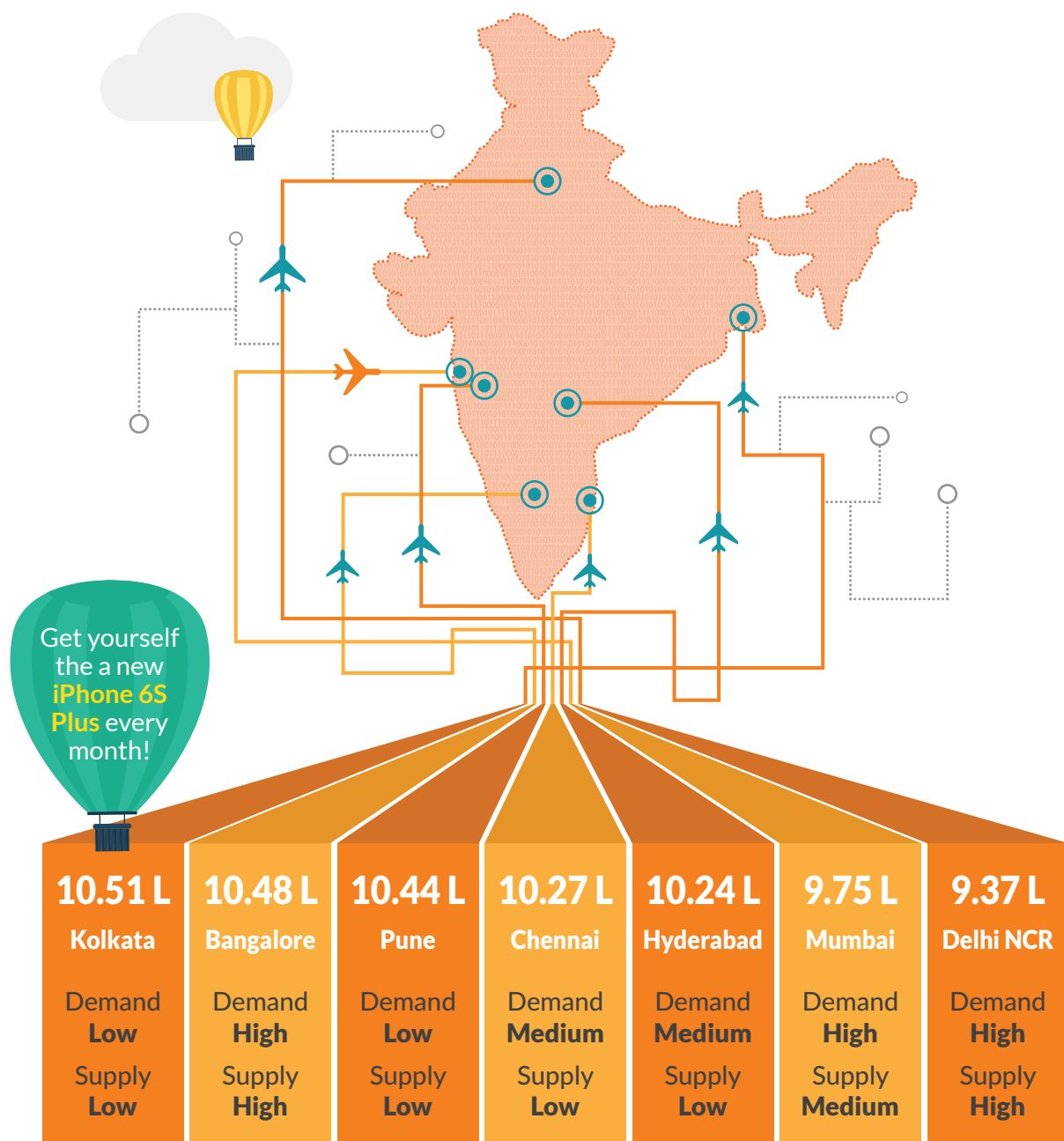
However, once the cost of living is factored in, things look different!

12.19 L	10.48 L	10.4 L	9.81 L	9.45 L	9.42 L	9.35 L
Mumbai	Bangalore	Delhi NCR	Pune	Chennai	Hyderabad	Kolkata

Salary in lakhs p.a.

Absolute Salaries

Maximum city pays the maximum money

SALARY SPREAD BY CITY
(Cost of Living Adjusted)

After factoring in the cost of living, Kolkata emerges as the best paying city to live in.

Get yourself the a new **iPhone 6S Plus** every month!

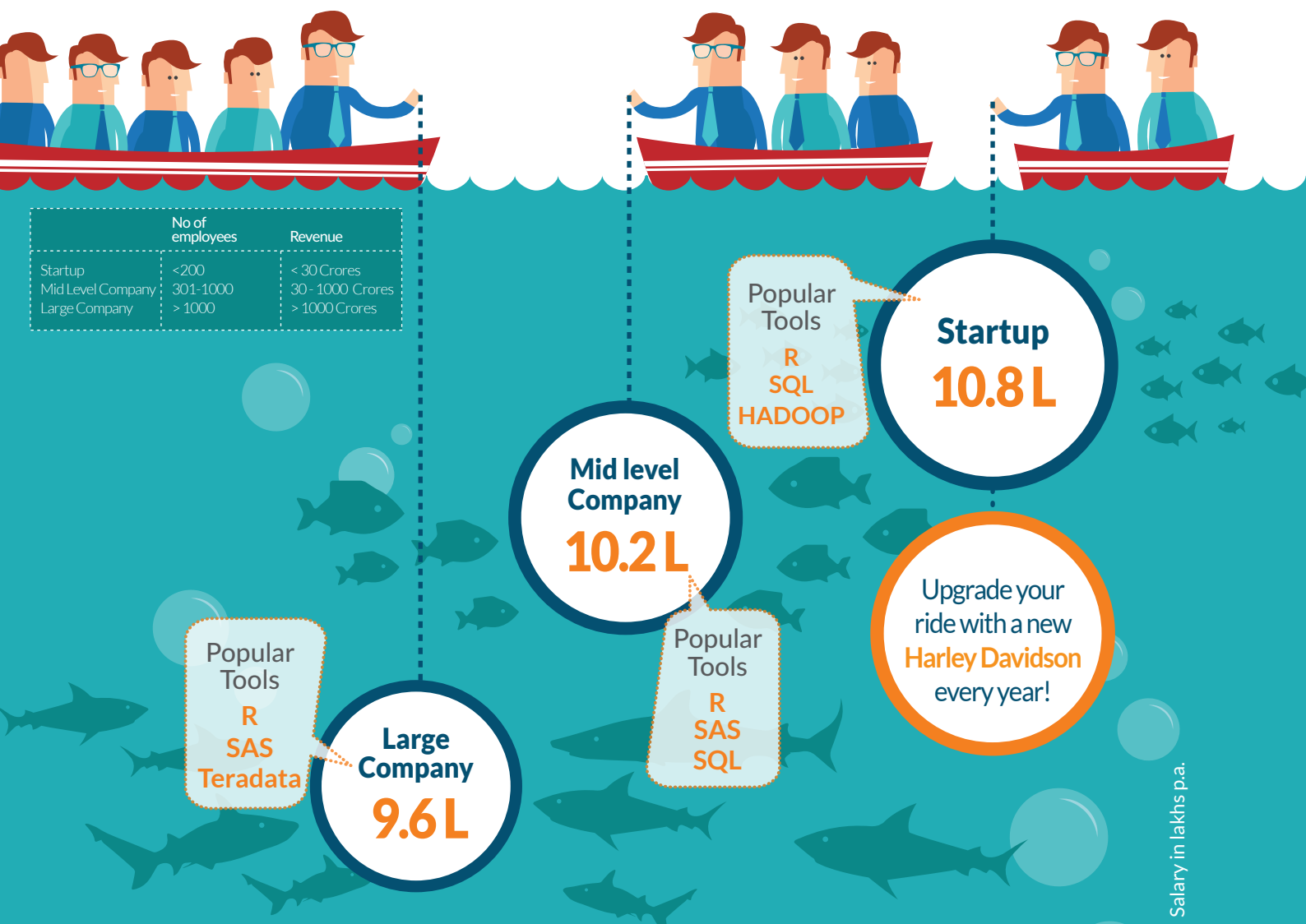| 10.51 L	10.48 L	10.44 L	10.27 L	10.24 L	9.75 L	9.37 L
Kolkata	**Bangalore**	**Pune**	**Chennai**	**Hyderabad**	**Mumbai**	**Delhi NCR**
Demand **Low**	Demand **High**	Demand **Low**	Demand **Medium**	Demand **Medium**	Demand **High**	Demand **High**
Supply **Low**	Supply **High**	Supply **Low**	Supply **Low**	Supply **Low**	Supply **Medium**	Supply **High**

Cost of Living Adjusted Salaries

Salary in lakhs p.a.

Live life kingsize in Kolkata

SALARY SPREAD AND
SKILLS REQUIRED BY COMPANY SIZE

Startups need people who know R and they are willing to pay top dollar for it. 10.8 lakhs p.a. by startups is a significant step up from the 9.6 lakhs p.a paid by larger companies.
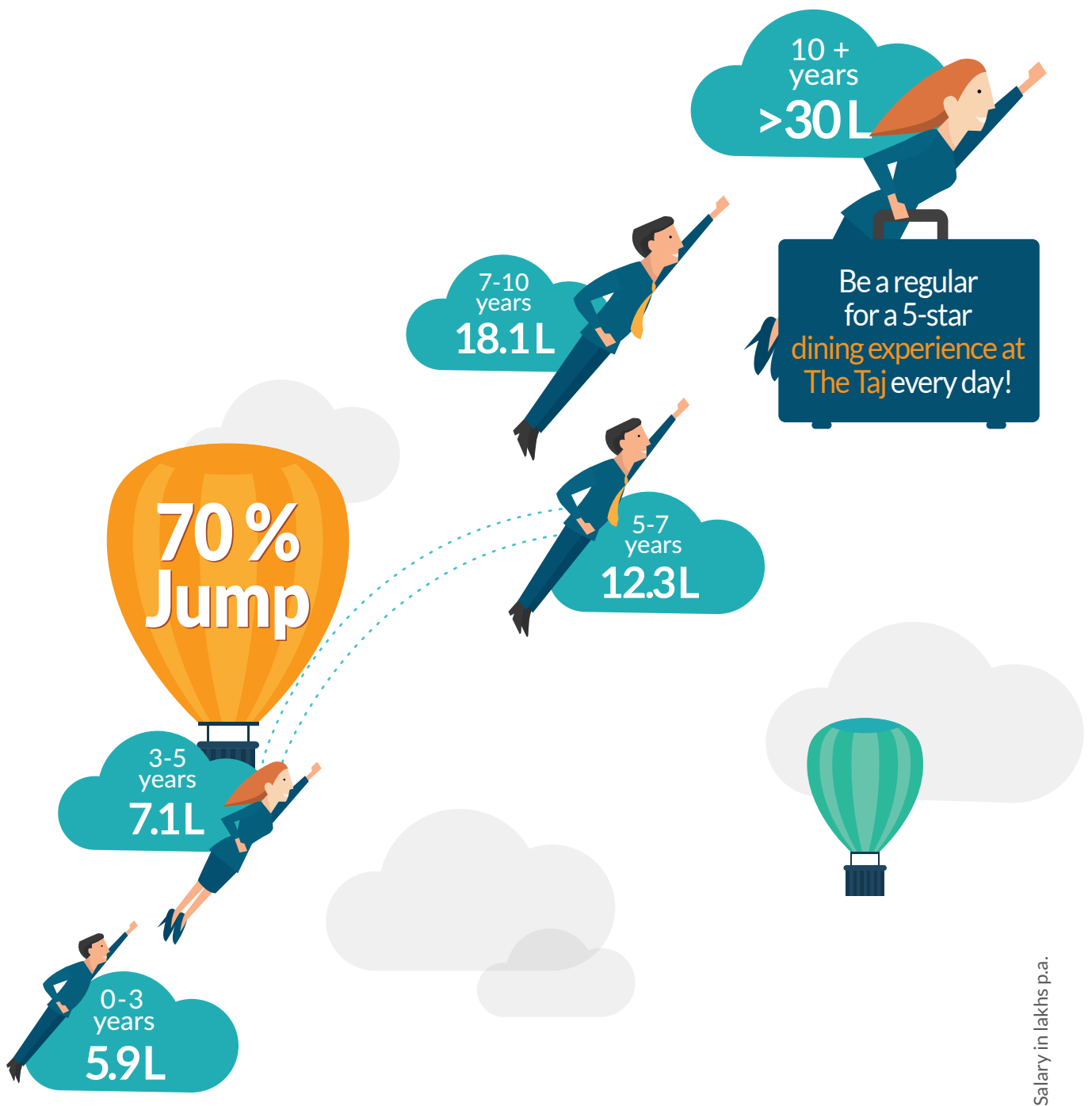
Even mid-sized companies are paying more than the large companies on average.

R is in great demand across the board. But, if you want to join a larger company, you need to add SAS to your skill set. This is because bigger companies can afford to pay for the more expensive enterprise versions of proprietary softwares like SAS.

	No of employees	Revenue
Startup	<200	< 30 Crores
Mid Level Company	301-1000	30 - 1000 Crores
Large Company	> 1000	> 1000 Crores

Popular Tools
R
SQL
HADOOP

Startup
10.8 L

Mid level Company
10.2 L

Popular Tools
R
SAS
SQL

Upgrade your ride with a new **Harley Davidson** every year!

Popular Tools
R
SAS
Teradata

Large Company
9.6 L

Salary in lakhs p.a.

Start small to earn big

SALARY SPREAD BY EXPERIENCE

10 + years
>30 L

7-10 years
18.1 L

Be a regular for a 5-star dining experience at The Taj every day!

70 % Jump

5-7 years
12.3 L

3-5 years
7.1 L

0-3 years
5.9 L

Salary in lakhs p.a.

The biggest jump in salaries is seen after the 5-year mark, where analysts can expect up to a 70% raise with an average pay of 12.3 lakhs p.a. A decade of experience can boost this figure by more than 250%.

Do the time, see the dime

SKILL WORD CLOUD

The word cloud is based on profile tags of analytics professionals who were part of the study. These tags were added by users themselves or were mined from their CV. The diagram represented below shows the distribution of the tags so collected.
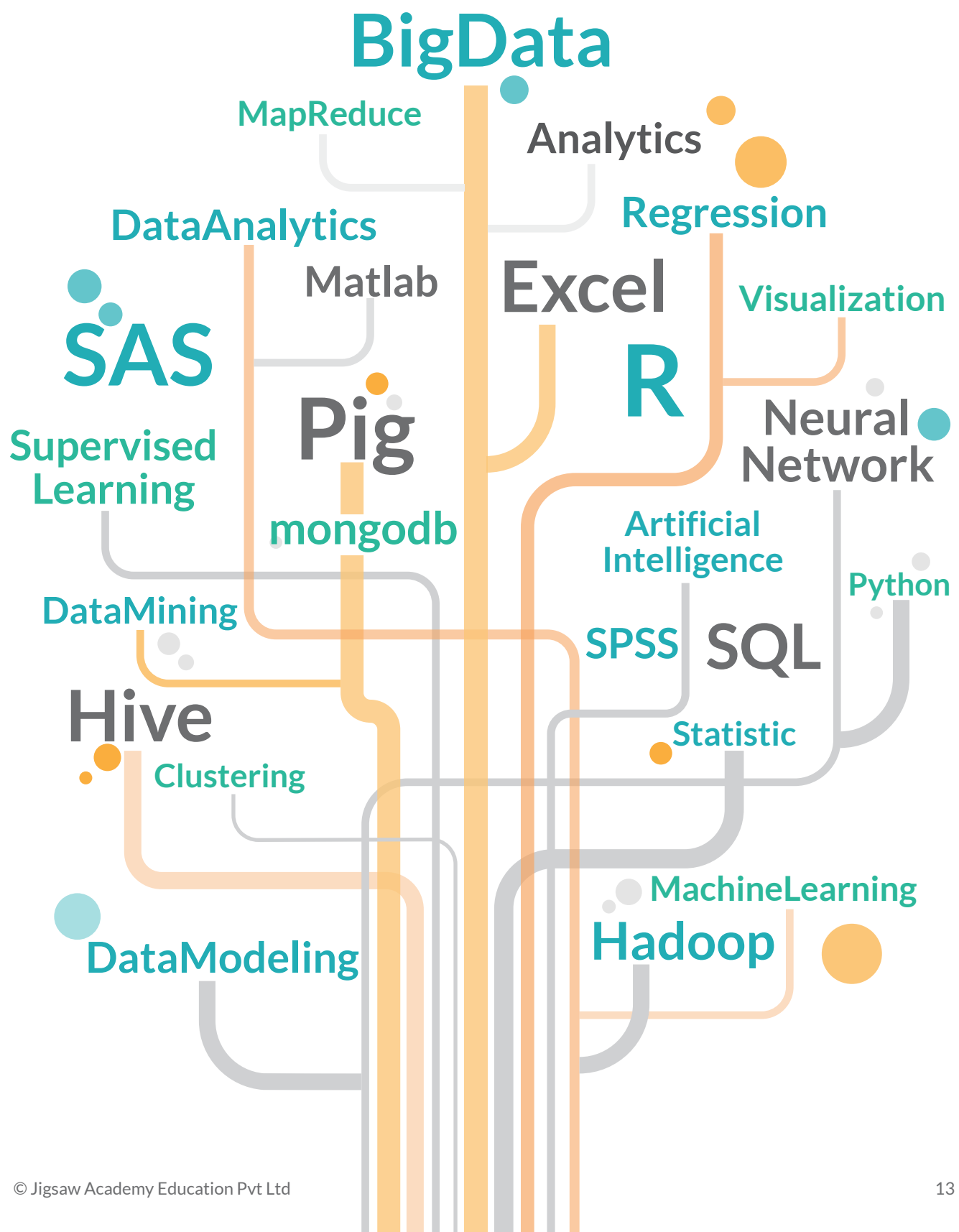
METHODOLOGY

The data points include 60,000+ people who contacted the Analytics Vidhya team through their website, via job platforms and other sources. This number also includes but is not limited to people applying for jobs on the Analytics Vidhya website, confidential searches, hackathons and tie-ups with skill enhancement partners.

People with only advanced analytics / data science skills were considered for the study. For example, people with entire experience in MIS have been excluded from the study. Once filtered, the skill sets of the survey participants were appropriately categorized in order to gain insights into the data.

The findings are open to biases arising because of the nature of jobs / competitions hosted on Analytics Vidhya's website. However we believe that even with this bias, this first-of-its-kind study of the Indian Analytics industry and the thousands of analytics professionals it employs, reveals many fascinating ground realities.

Three Tips for Anyone Considering a Career in **Data Analytics**

"

It doesn't matter what our educational background is, we can all crack analytics. I did it as a commerce graduate. If you have an interest in data and want to transition to an analytics role, believe in yourself and make it happen." **Clarence Wong**, Jigsaw Academy graduate, Architect at Data Science at ValueLabs, Hyderabad

Perhaps you have discovered a passion for analytics at work, and want to acquire a more in-depth understanding of specific analytics software. Or maybe you want to switch careers altogether, and do work that's analytics-intensive. Whatever your motivation, here are a couple of suggestions to help you make an informed foray into this field.

TIP 1
Do an honest **self-assessment**

Ask yourself if you're temperamentally suited to being a data scientist for the long haul. Data analysts have an investigative bent of mind and enjoy solving puzzles. They also spend large chunks of time on their own, adrift in a sea of numbers, trawling and inspecting huge caches of random data to see if they can discern any meaningful patterns or telling incongruities.

"

As **Frank Coleman,** who is Director of Business Operations for EMC Global Services puts it, *"[...] as I recruit talent and continue to build my teams, I'm not just looking for technical skills; I'm also looking for the right personalities."*[1]

TIP 2
Familiarise yourself with
the data analytics landscape

Analytics comprises varied techniques and tools that can be deployed in different permutations and combinations, for purposes as diverse as business intelligence and healthcare management. Your intended work 'domain' will dictate the kind of courses you take. Also keep in mind that certain software skills are in greater demand in some professions/sectors than others.

> *In* **Clarence Wong's** *case[2], though he used some basic analytics at his job in HSBC's anti-fraud division, his interest kicked into high gear only after he joined Google. He started using techniques like clustering and decision trees, along with software like R and Python. This got him to seriously consider a course in analytics.*

TIP 3
Plot a **course of action**

Figure out if you want to go back to college to get a degree in data science, or if doing an intensive certification course is more pragmatic. Do some reconnaissance to figure out which universities/institutes are best suited to your needs.

> **Clarence Wong** picked a course from Jigsaw Academy because he felt *"that they were most application-oriented and their curriculum was flexible, when compared with certification programmes at IIM, ATI and NIIT Imperia."*

[1] https://infocus.emc.com/frank_coleman/6-personality-traits-your-data-science-team-needs/
[2] http://analyticstraining.com/2014/is-analytics-only-for-people-with-tech-backgrounds/

Most In-Demand Data Science Skill sets

While data analytics skills are in great demand these days, some skills are more in demand than others. Your hands-on experience with different kinds of software will help command better salaries than expertise in just one.

> *Research shows that data scientists familiar with both R and Python make close to 1 lakh more than analysts who only know R, and nearly 2 lakhs more than analysts who only know Python[1].*

The following skills and specialisations were featured the most in 2015's job listings.

Big Data

According to Computer Business Review Online, Big Data was cited 112,469 times between January and June 2015[2] in the classifieds - garnering 118% more mentions than it received during the same period in 2014.

> *The median salary for Big Data professionals is six figures and comes to about $104,850.*

Popular Big Data-specific skills include statistics, programming, and mathematical modelling. A combined knowledge of R and Python, for example, can equip you with these.

R

Sometimes referred to as 'a hyperactive version of excel', R is used by organisations as varied as Facebook, Google, Bank of America, and The New York Times[3]. It's used to sift through gargantuan data sets, that it can then easily 'manipulate' using modelling techniques and powerful data visualisation tools[4].

R is also proving its mettle in the world of Machine Learning, which, according to Google's Eric Schmidt is *"the technology that enables computers to get smarter and more personal"*[5], which is where he believes the future of his company lies.

Python

Codeval.com rated Python the number 1 coding language in the world, for the fourth year in a row, in February 2015[6]. Developed by Guido Van Rossum in the mid-90s, *Python is a versatile, open-source programming language and framework that Google has utilised and invested in quite heavily, ensuring its widespread use and popularity.*

Touted as the 'easiest programming language to learn'[7], Python's framework can be used not just to create web apps (like Pinterest and Instagram), but also to perform analytics.

Hadoop

Like Big Data, Hadoop was referenced 31,274 times in job advertisements, an increase of 118% over the previous year's mentions. With its capacity for computing Big Data on a large scale, Hadoop's appeal shows no sign of diminishing.

> *It is expected to demonstrate a compound annual growth rate of 58.2% between 2013 and 2020.*

Conclusion

" *If the future is bright for Big Data scientists, it is especially radiant for professionals who can demonstrate their mastery over diverse programming and statistical frameworks.*

[1] Reference our Analytics & Big Data Salary Report 2016

[2] http://www.cbronline.com/news/big-data/software/big-data-jobs-5-most-in-demand-skills-4739437

[3] http://www.fastcompany.com/3030716/the-9-best-languages-for-crunching-data

[4] http://www.infoworld.com/article/2940864/application-development/r-programming-language-statistical-data-analysis.html

[5] http://www.analyticsvidhya.com/blog/2015/08/common-machine-learning-algorithms/

[6] http://blog.codeeval.com/codeevalblog/2015#.VqC4LCp97IU=

[7] http://www.inc.com/larry-kim/10-most-popular-programming-languages-today.html

Three Industries That Aspiring Data Scientists Should Target in 2016

The data revolution of the late 20th and early 21st centuries changed how organisations marshal, manage, utilise and interact with electronic information. If Big Data is the digital equivalent of oil, then analytics frameworks are the machinery used to tap, siphon, and convert 'crude' into info-fuel. Given this scenario, individuals with the technical expertise to facilitate such a complex process are in great demand.

So who exactly is hiring these experts? "Well, who isn't?!" would be the best answer to that question!

> *Demand for Big Data has diversified, and is no longer limited to just a handful of industries like a few years ago. According to experts, this is because small and medium-size companies have also started to hire data analysts in diverse industries.*

These are the top five industries driving the demand for data science skills in 2015 (experts expect this trend to continue in 2016 as well[1])

- Professional, Scientific, and Technical Services (PST)
- Information Technologies (IT)
- Manufacturing
- Finance and Insurance
- Retail

Let's take a closer look at the top three industries, particularly key segments:

Biopharmaceuticals (PST)

> *The biopharmaceutical sector accounts for "about 85% of the PST sector's total R&D spending."[2] Much of this goes towards building Big Data and analytics capacities (especially predictive), in areas such as CRM (customer relationship management) and R&D Informatics."[3]*

Bio-pharma is growing with incredible speed in India. This industry, which entails vaccine development, therapeutics and diagnostics is Indian pharma's most lucrative sub sector.

Bio-pharma generates 62% of the PST sector's total revenue, which amounts to $1.9 billion or Rs 12, 600 crore a year.[4]

In tandem with the Indian Bio-IT sector, which offers data analytics "solutions through contract research organisations (CROs)"[5] to various companies around the world, it is clear that there is an escalating need for talented data scientists in the Indian pharmaceutical field.

Cybersecurity (IT)

As a generation of internet users accesses the web solely through WHDs (wireless handheld devices), cybersecurity solutions driven by predictive analytics will gain tremendous traction.[6]

Neutralising cyber threats through the use of predictive analytics is helping security professionals identify and track cyber-crime in real time.

Todd Pedersen, a cybersecurity expert at CSC confirms this shift, saying, "We used to make statements, such as 'I have a firewall; I'm protected,' or 'I have antivirus software; I'm protected,'" "Now, the conversation is less about preventing an attack, threat or exposure, and more about how quickly you can detect that an attack is happening."[7] This makes cybersecurity an industry worth targeting, and not just for cyber criminals.

Manufacturing

From machine utilisation to demand forecasts to quality improvement, Big Data analytics is proving to be indispensable to the manufacturing sector.

The advent of e-commerce and the growth of the digital marketplace have changed the way manufacturing works. They have rendered the boundaries between companies and their customers increasingly porous, making it easier for businesses to predict the likelihood of customer demands (forecasts) for specific products.

The capacity to gauge customer demand, using Big Data and advanced analytics, allows companies to calibrate production accordingly. Analytics can also improve critical components of the production process, such as machine utilisation, by increasing 'machine uptime' or functioning.[8]

Conclusion

Given the limited presence of talented data scientists, both globally and in India[9], and soaring cross-sectoral demand—especially in the fields outlined above—individuals with the right skills are truly spoiled for choice.

[1] http://www.forbes.com/sites/louiscolumbus/2015/11/16/where-big-data-jobs-will-be-in-2016/#58409693f7f1

[2] http://www.iriweb.org/sites/default/files/2016GlobalRDFundingForecast.pdf

[3] ibid

[4] http://www.ibef.org/industry/pharmaceutical-india.aspx

[5] https://www.outsource2india.com/kpo/articles/bio-it.asp

[6] http://www.techrepublic.com/blog/10-things/10-predictions-for-the-it-job-market-in-2016/

[7] http://www.csc.com/cybersecurity/publications/93325/104033-using_big_data_to_defend_against_cyber_security_threats

[8] By "comparing past machine failures to sensor data from the machines to identify patterns before breakdowns occur" http://cerasis.com/2015/12/07/6-manufacturing-trends-to-watch-out-for-in-2016/

[9] By 2018 India will be short of 2 lakh data scientists

Data Analysts Should Develop More Than Just Their Technical Skills. Here's Why.

Mark Twain once wrote, "Don't let school interfere with your education." What he meant to say (in part) was that true learning doesn't stop when we graduate. This is as true for graduates as it is for seasoned professionals.

> *If your skills are no longer relevant, no matter which way you slice it, you're like a chef with a blunt knife—ineffectual.*

Nowhere is this more pertinent than in data analytics. As ICTs evolve and generate newer, more affordable solutions for persistent problems, practitioners will have to keep pace if they want to experience career growth and remain relevant.

There are, however, certain so-called 'soft skills'—professional traits and habits—that can burnish an analyst's existing credentials. Here are some of them:

Being proactive

> *Keep track of market trends and actively seek out opportunities to expand your data skillsets.*

As Ed Burns, editor of SearchBusinessAnalytics puts it, "It would be best to proactively acquire the skills necessary for dealing with data now rather than wait for your employer to decide that these skills are a core competency of your job[1]." If this applies to individuals without a data science background, it is doubly important for analytics professionals, who run the risk of complacency.

Don't rest on your laurels—add to them.

Being 'presentable'

> *Writing up and presenting your insights with clarity, and articulating data-based inferences/findings with style, adds tremendous value to the work you produce.*

Beefing up your core competencies involves more than just learning how to use the latest and most lucrative skills; it entails the ability to formulate and effectively communicate the results of your analytics work.

Learning to liaise

> *If you master both the 'what' and the 'how' aspects of analytics, you can bridge the gap between BI (business intelligence) and IT.*

Often, professionals who are knowledgeable about IT, are clueless about business strategizing and development. If you can serve as a conduit between these two nerve centres, and create a synergy between them, you will become indispensable.

Attending industry events

> *Attending conferences and events is a great way to network, gauge emerging trends, and learn from peers and thought leaders.*

Kaggle[2] meets make a great addition to your resume, and give you an opportunity to put your analytics skills to the test. Since participants' performances are rated, future employers have a way to objectively gauge their skill range and levels.

Employees who evolve along with the market, and who take the initiative to pursue a range of technical and non-technical skills, are priceless. Their high salaries are just an industry's way of scrambling to put a price on them.

[1] http://searchbusinessanalytics.techtarget.com/opinion/Take-your-data-analysis-skills-to-the-next-level
[2] http://www.kdnuggets.com/2014/11/9-must-have-skills-data-scientist.html