4IR Implication on Values & Ethics

Persidangan Perkhidmatan Awam
Sempena Hari Perkhidmatan Awam Kali Ke-26, 2019

19 November, 2019

Muhammad Anshari, PhD
Universiti Brunei Darussalam, School of Business & Economics (Assistant Professor)

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UBD SCHOOL OF BUSINESS AND ECONOMICS

AACSB Business Education Alliance Member

ACCREDITED ACCA PROGRAMME

To provide quality education and nurture innovative and caring leaders to contribute to the community.

Agenda

- Introduction
  - Technology changes human behavior leading to changes of business model
- Introduction of 4IR
  - CPS (Cyber Physical Systems)
  - IoT and Big Data
  - Job Matrix Framework
- Values & Ethical Challenges
- Brunei & 4IR
- Conclusion

Source: UN Report

Gender		District	
Male	50%	BRUNEI-MUARA	79%
Female	50%	TUTONG	10%
		BELAIT	9%
		TEMBURONG	3%
Age		**Monthly Income**	
20 years or younger	49%	____ 1000 or lesser (1)	71%
From 21 up to 30 years	29%	____ 1000 – 3000 (2)	20%
From 31 up to 40 years	10%	____ 3000 Above (3)	8%
From 41 up to 55 years	10%		
Above 55 years	3%		
	100%		
Educational Level		**Occupation**	
Secondary School or below	16%	Student	62%
High School	19%	Government Officer	20%
Undergraduate	55%	Private Company	9%
Postgraduate	10%	Business Owner	2%
		Others	5%

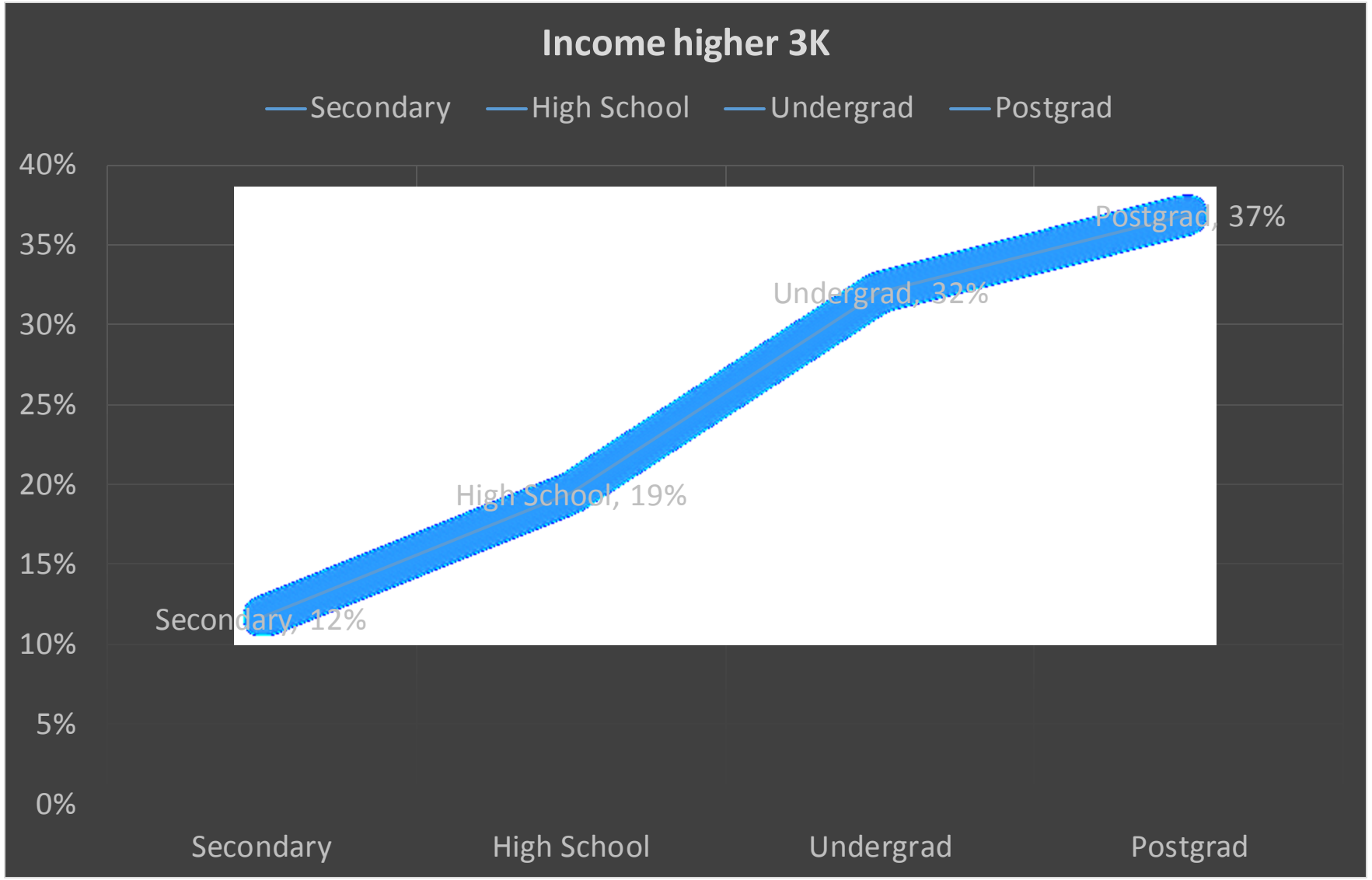
How many hours use smartphone daily?		How many smartphone do you have?	
Less than 6 hours	28%	only one	73%
6 – 12 hours	48%	Two	21%
Always connected 24 hours 7	24%	more than two	6%
Device Platform your smartphone?		**Computer & Internet skills**	
Apple IPhone / Ipad	39%	Developer (Apps or Web)	15%
Samsung	41%	Advance user (Aware with security	33%
Sony	8%	Moderate user (know-how use Internet)	45%
HTC	3%	Beginner (learning how to use)	6%
Blackberry	0%		
Nokia	2%		

People Behavior and Smartphone..!!

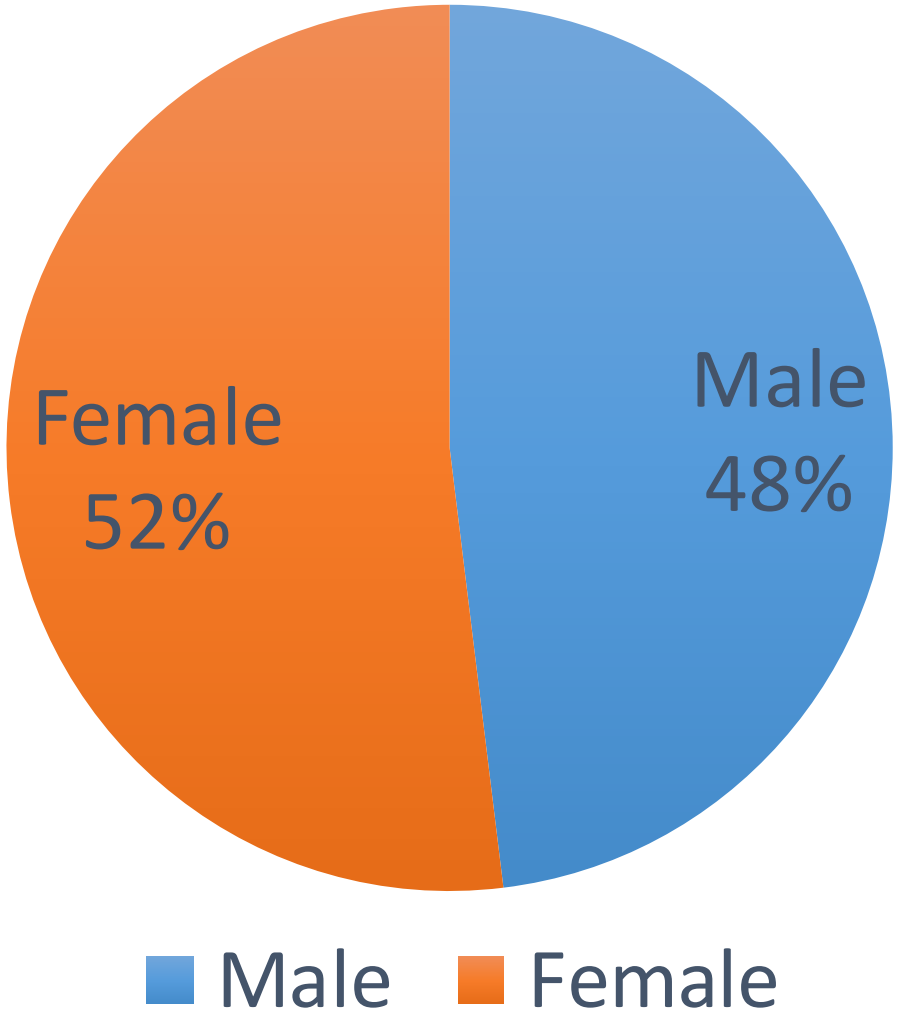
	Agree	Sometimes	Disagree
I use smartphone at restaurant			
I use smartphone at restroom			
I can't live without my smartphones			
I use smartphone at transport			
Do you check your smartphone at times without any reason?			
Do you check and use your smartphone during face-to-face interactions?			
I use smartphone at work/lecture			
I can manage my time			

“Smart” phone..!!

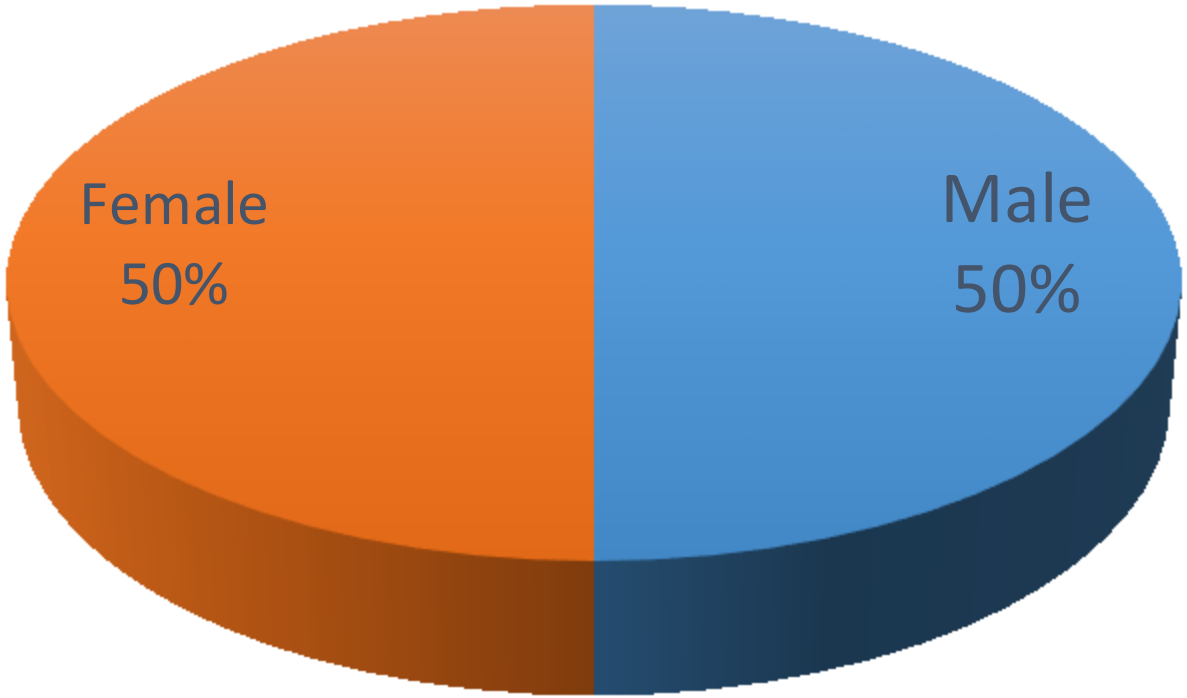
	Agree	Sometimes	Disagree
Smartphone disturbs my academic/work			
Smartphone help improves my academic/work			
I feel happier when I am using smartphones			
I don't get upset easily			
I am always optimistic about my future.			


Income higher 3K
Secondary
High School
Undergrad
Postgrad
40%
35%
30%
25%
20%
15%
10%
5%
0%
Secondary, 12%
High School, 19%
Undergrad, 32%
Postgrad, 37%
Secondary
High School
Undergrad
Postgrad

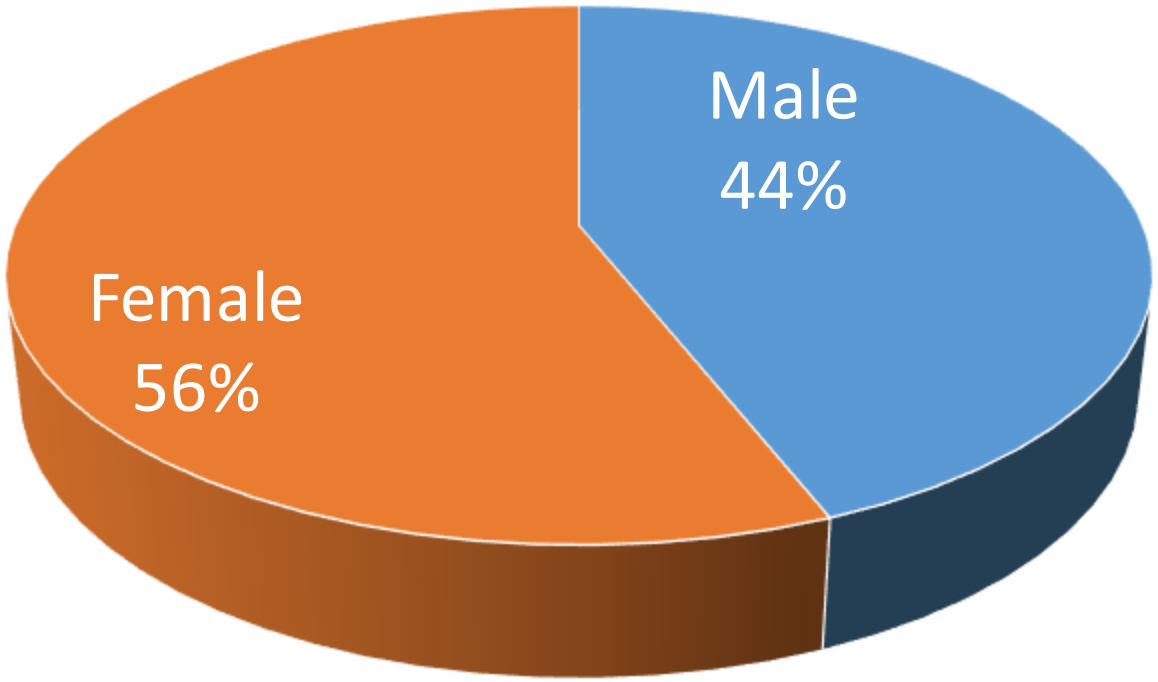
University and Gender



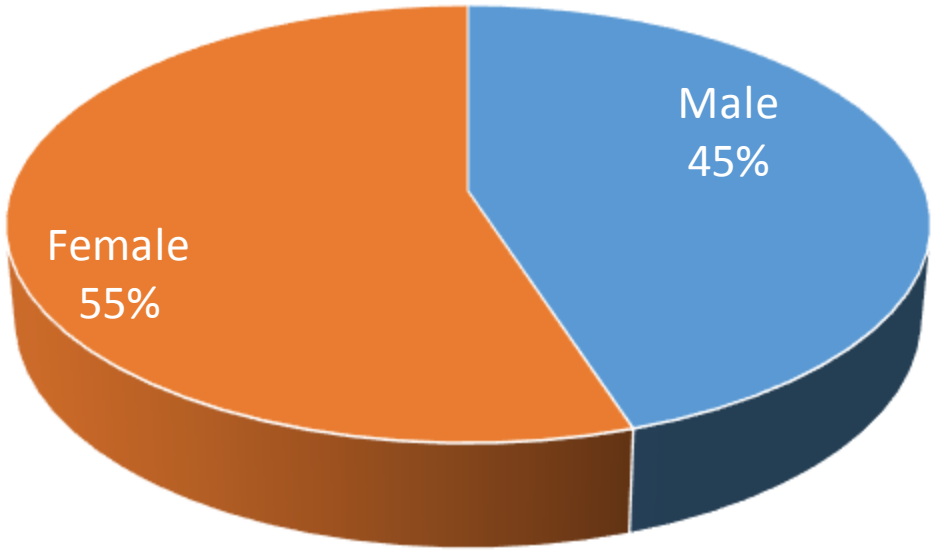
Use smartphone at Work / Class



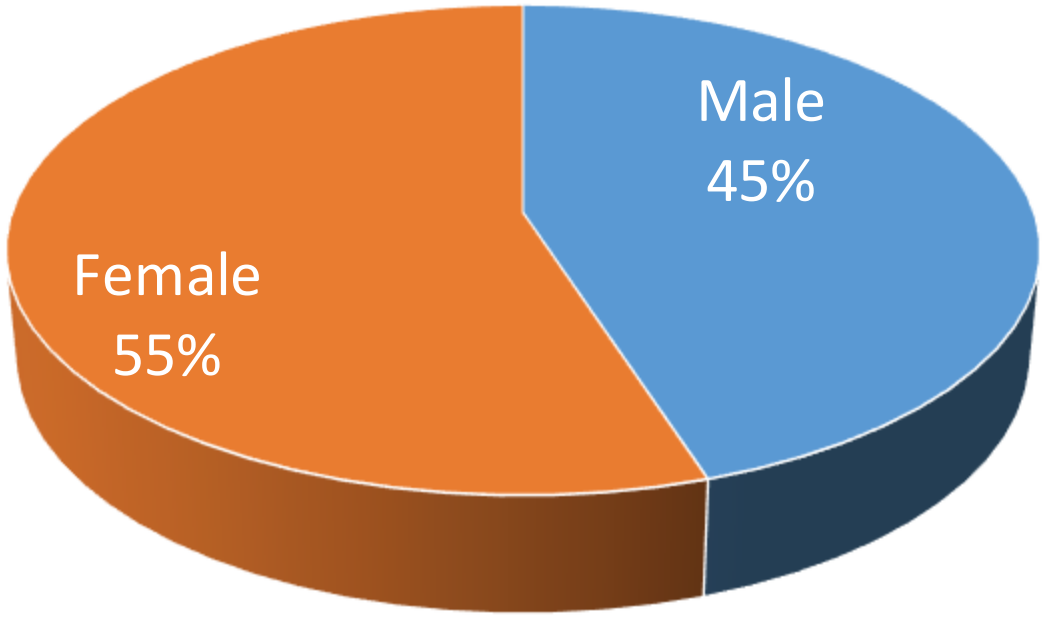
Managing Time



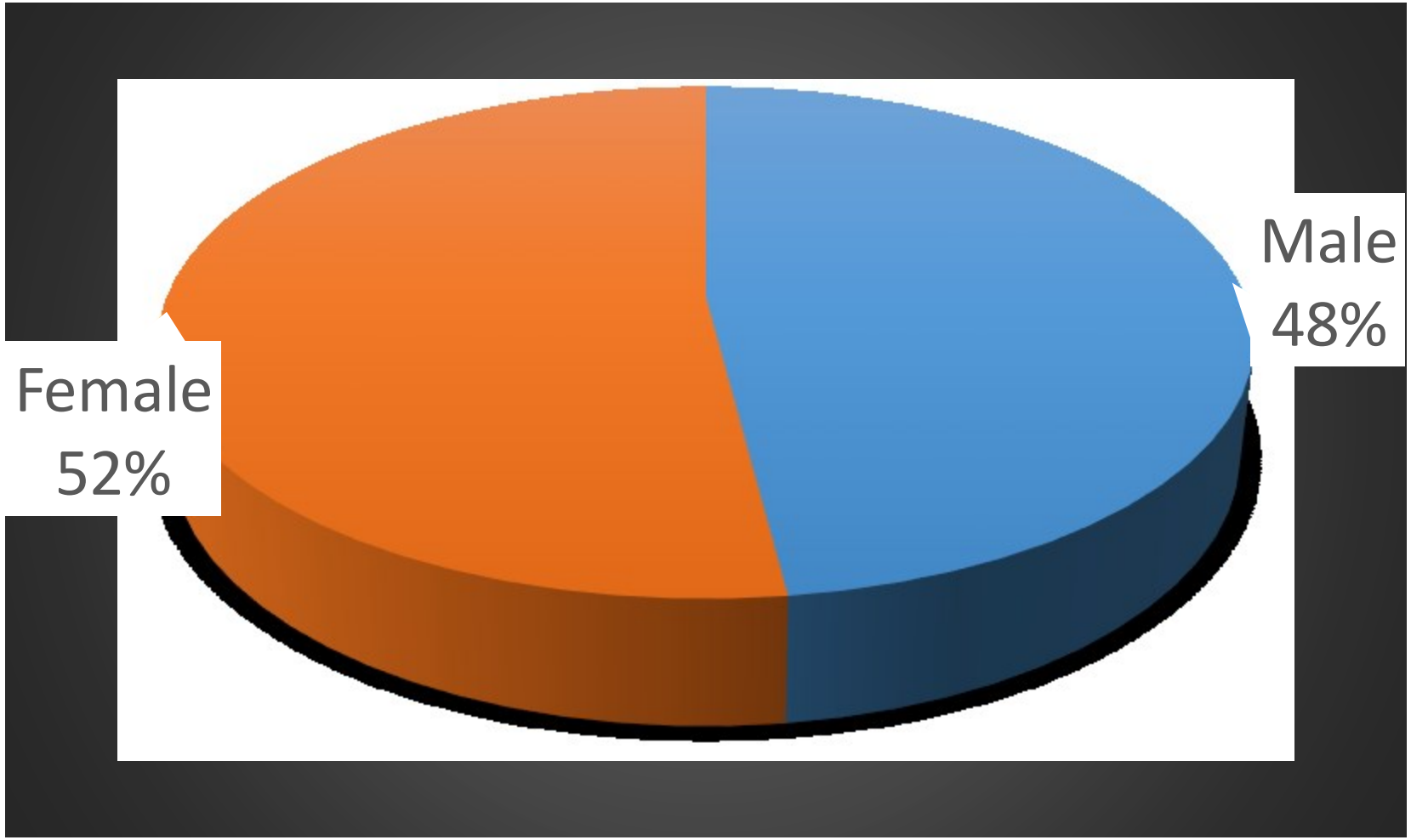
Check smartphone during Face2Face conversation



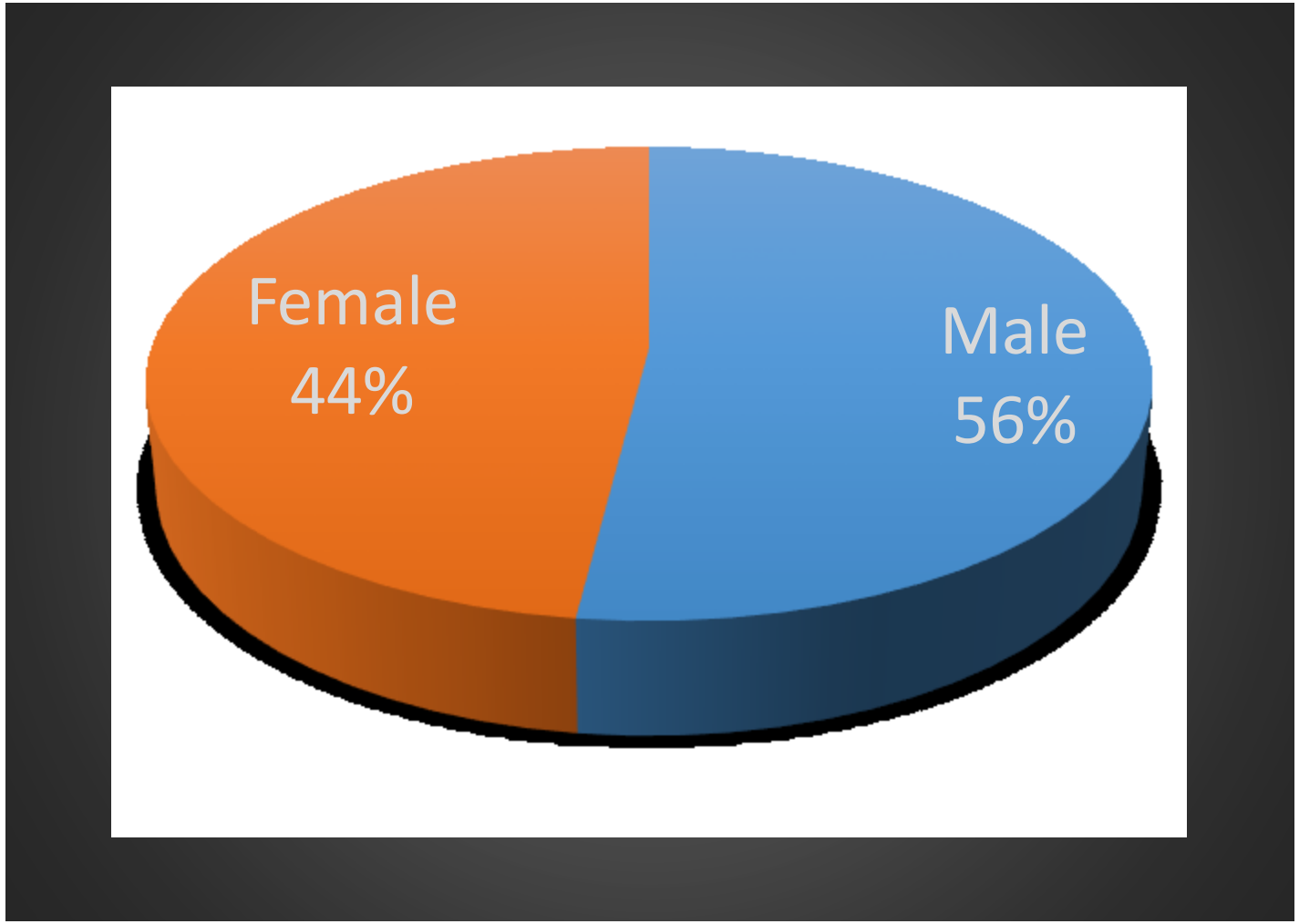
Do you check your smartphone at times without any reason



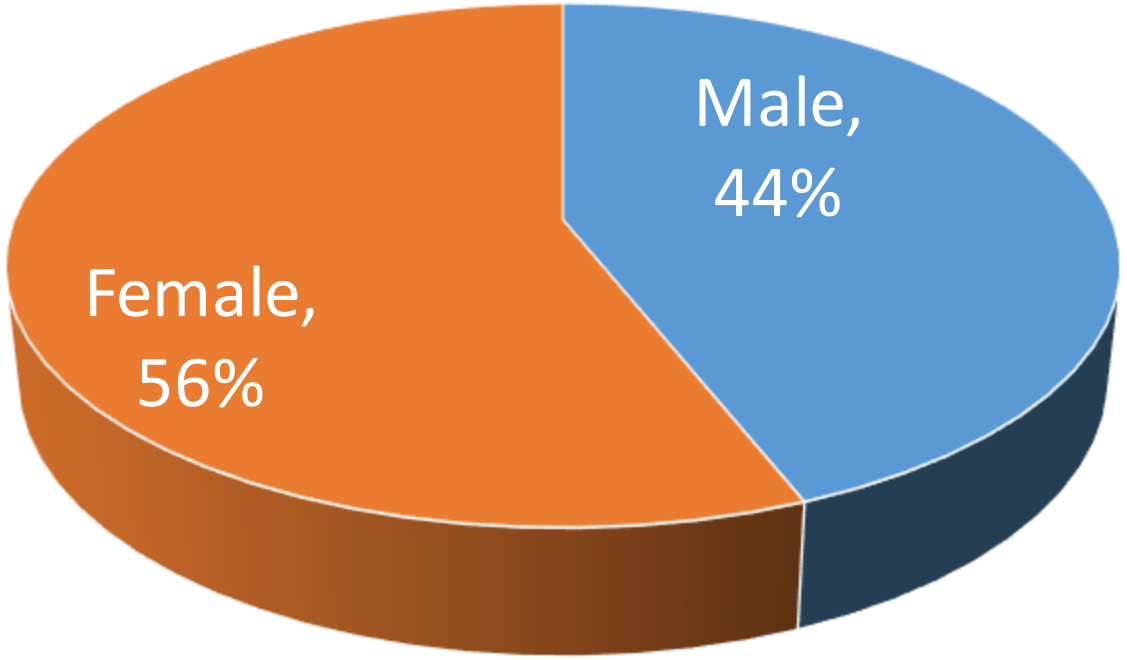
I use smartphone at restaurant



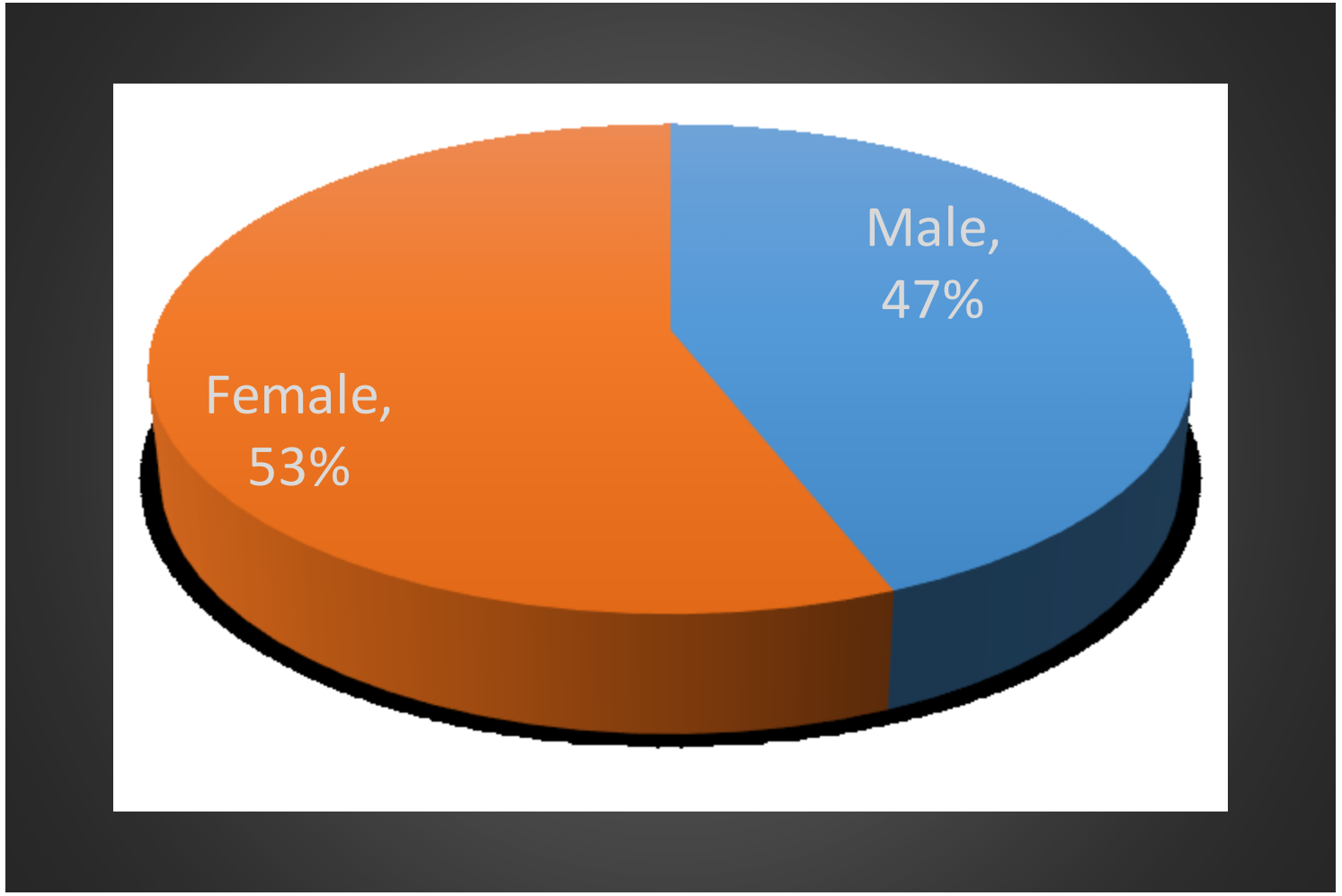
Use smartphone at transport



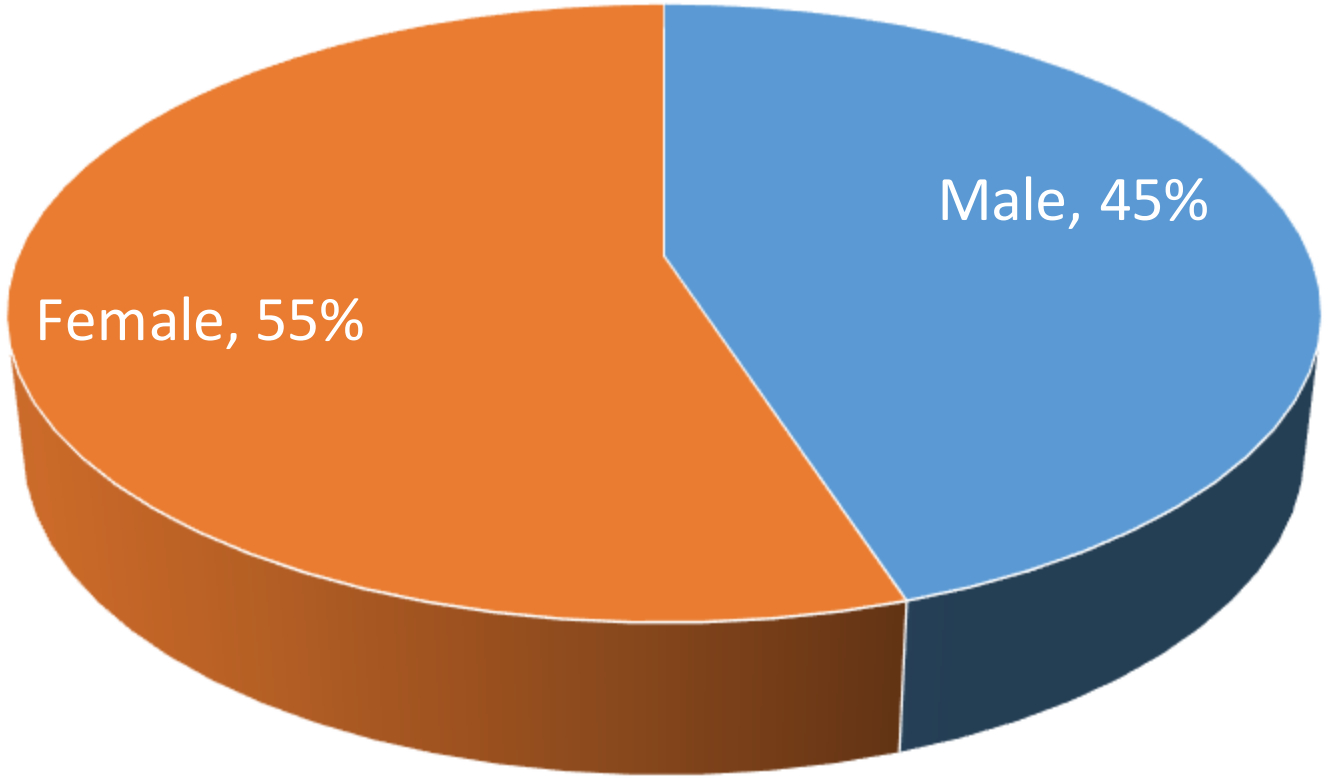
Cant live without smartphone



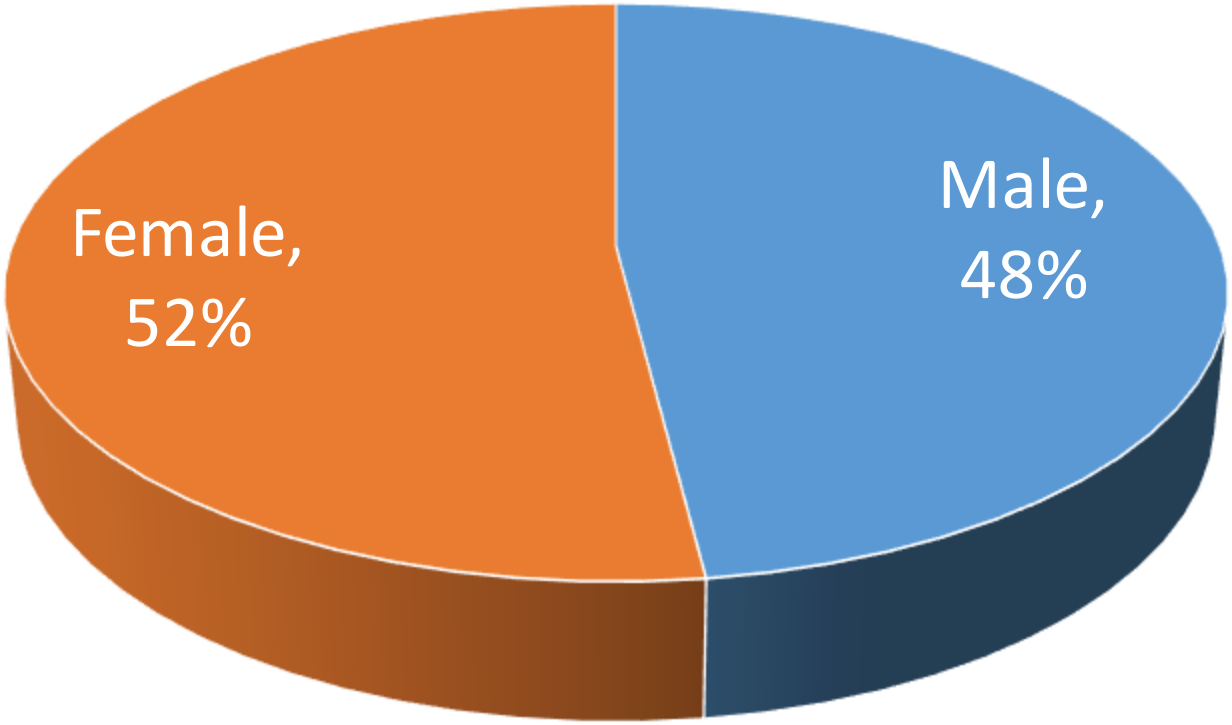
Use smartphone @ restroom



I am always optimistic about my future

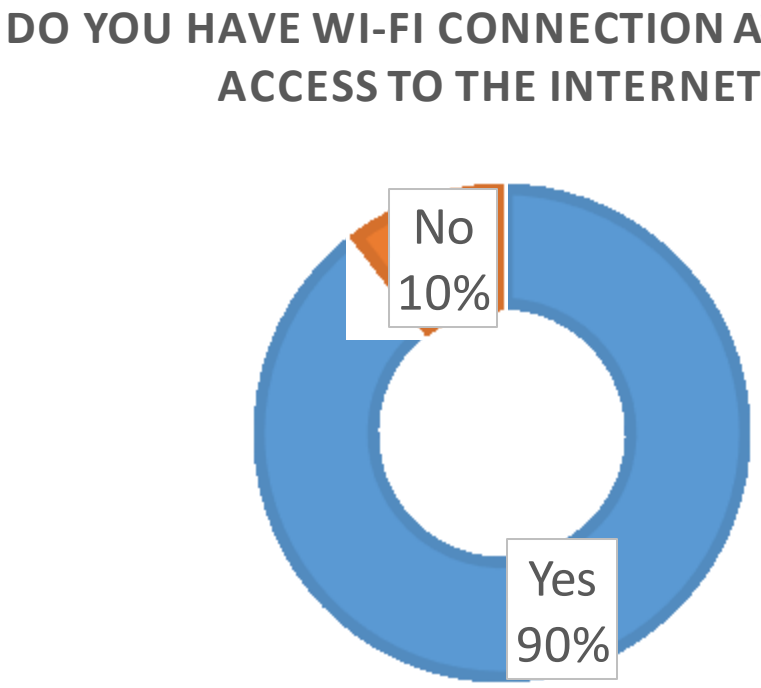


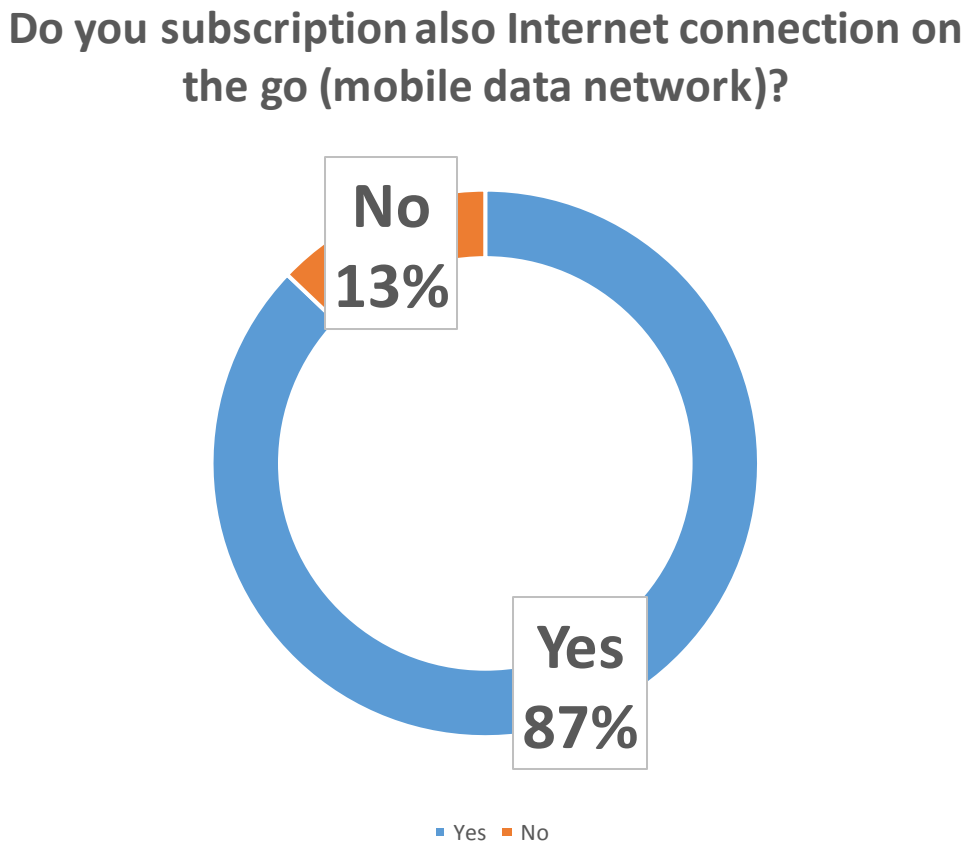
I feel happier when I am using smartphones



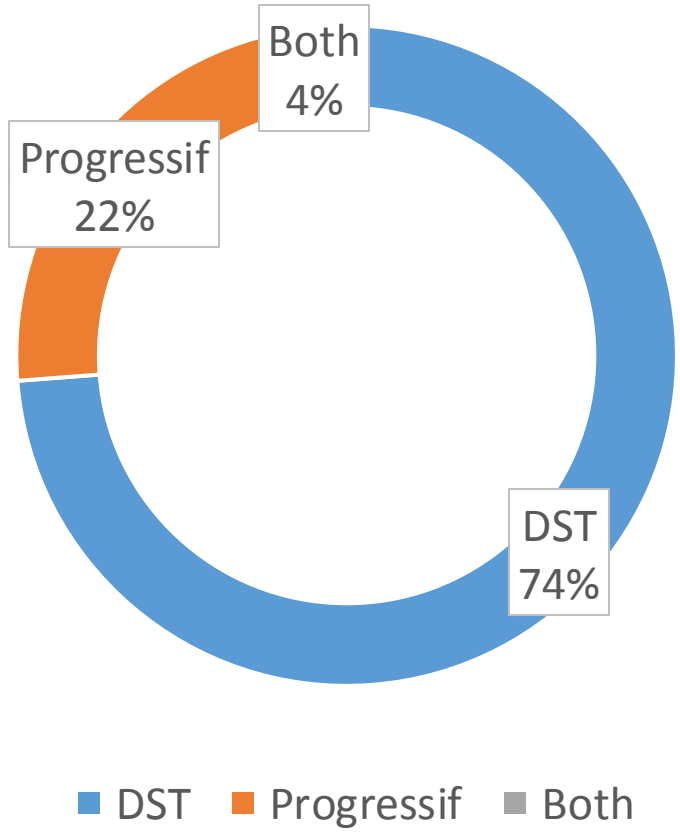
Activities / day	Consistently	Several times	Once	Never
Social networks	**38%**	**47%**	9%	6%
Instant messenger (WhatsApp, etc)	**77%**	**20%**	2%	1%
Game Online	15%	**27%**	**24%**	**34%**
Music / Video streaming	**34%**	**44%**	**14%**	7%
Shopping online using Apps	10%	**33%**	**23%**	34%
Online learning / study on the go	18%	**42%**	**19%**	**21%**
Reading e-news / e-book	16%	**36%**	**25%**	23%

2019 Millennials Preferences & Habits

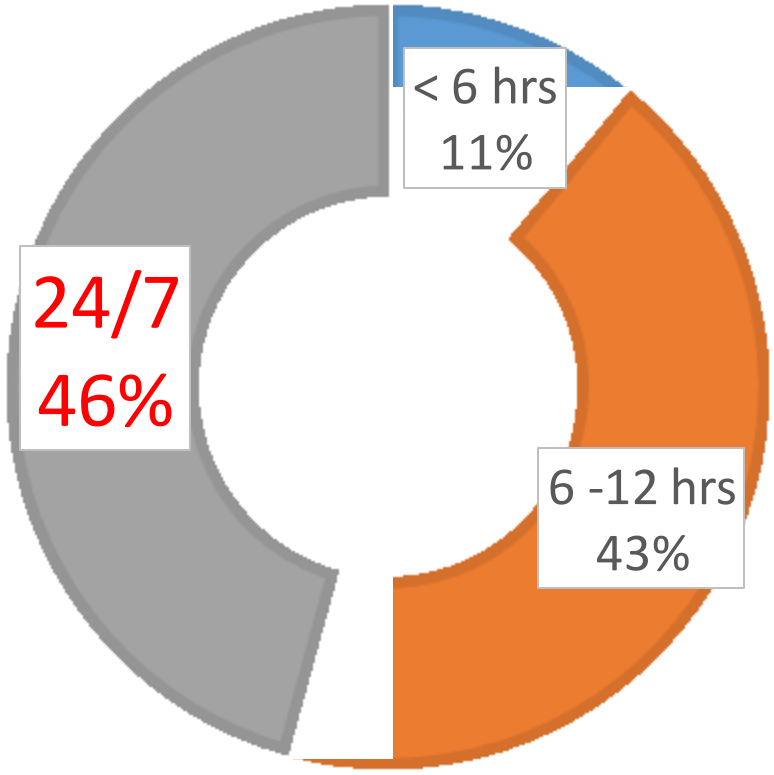




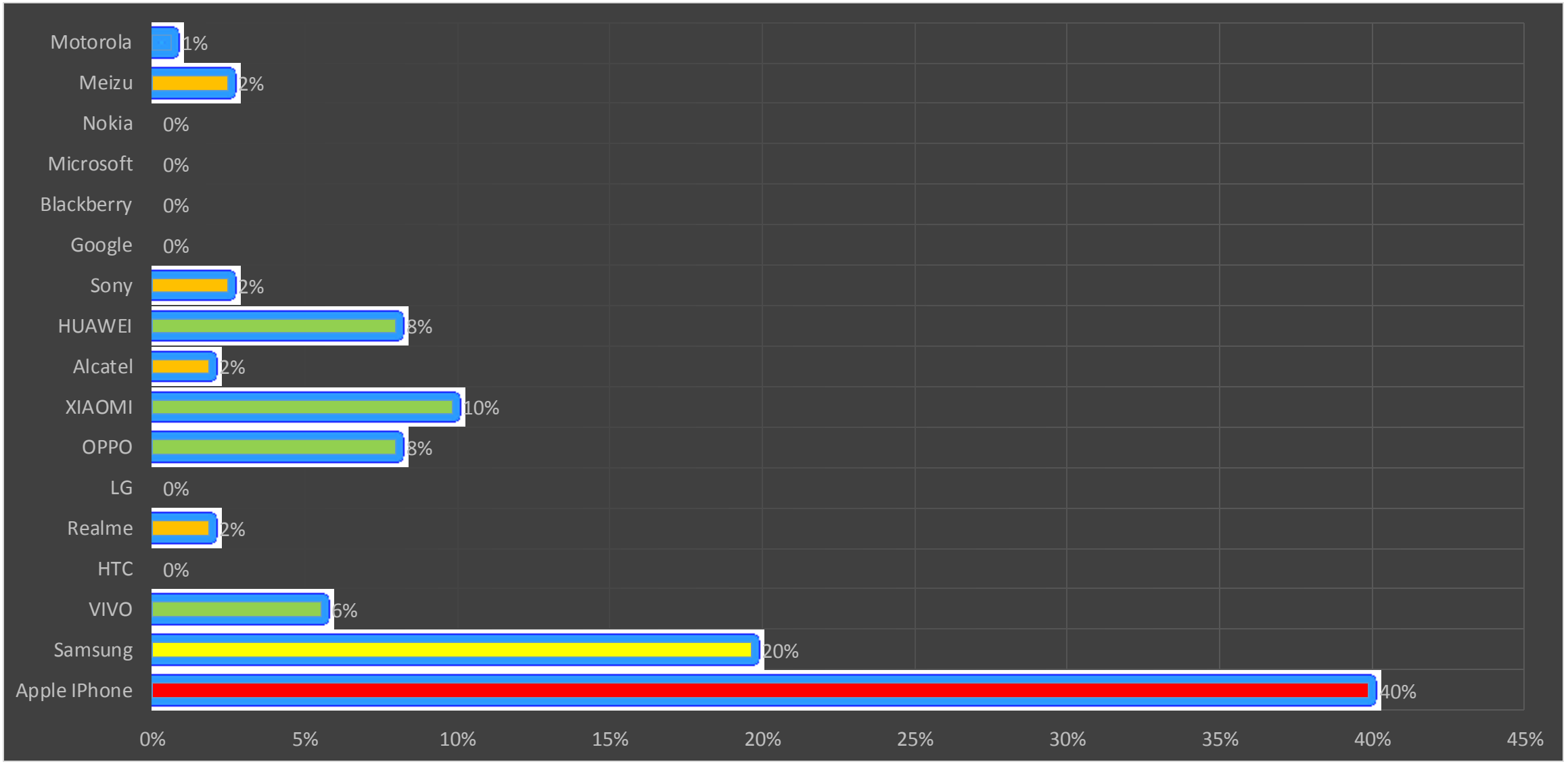
Your mobile data network provider



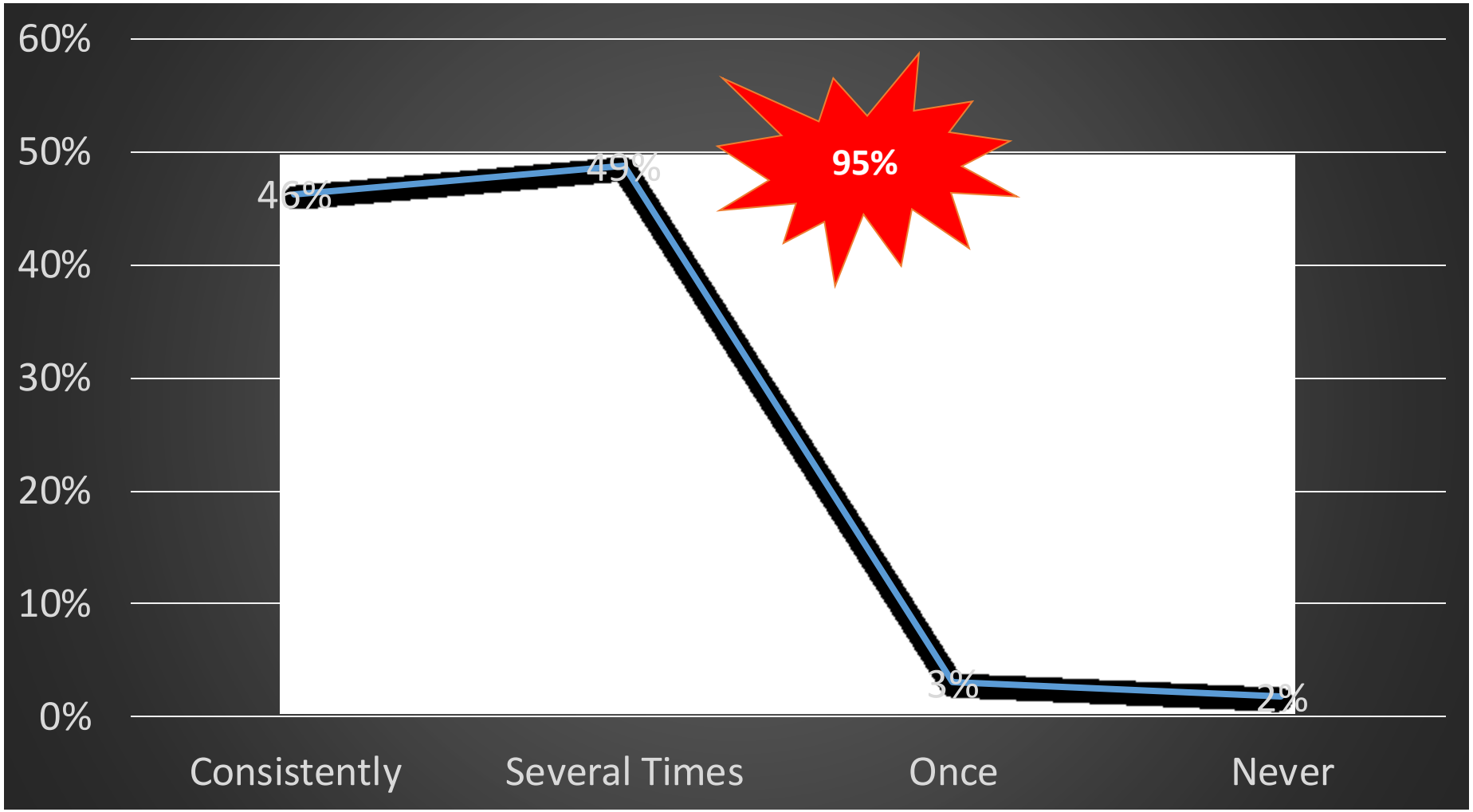
How many hours do you connect or use Internet using your smartphones daily?



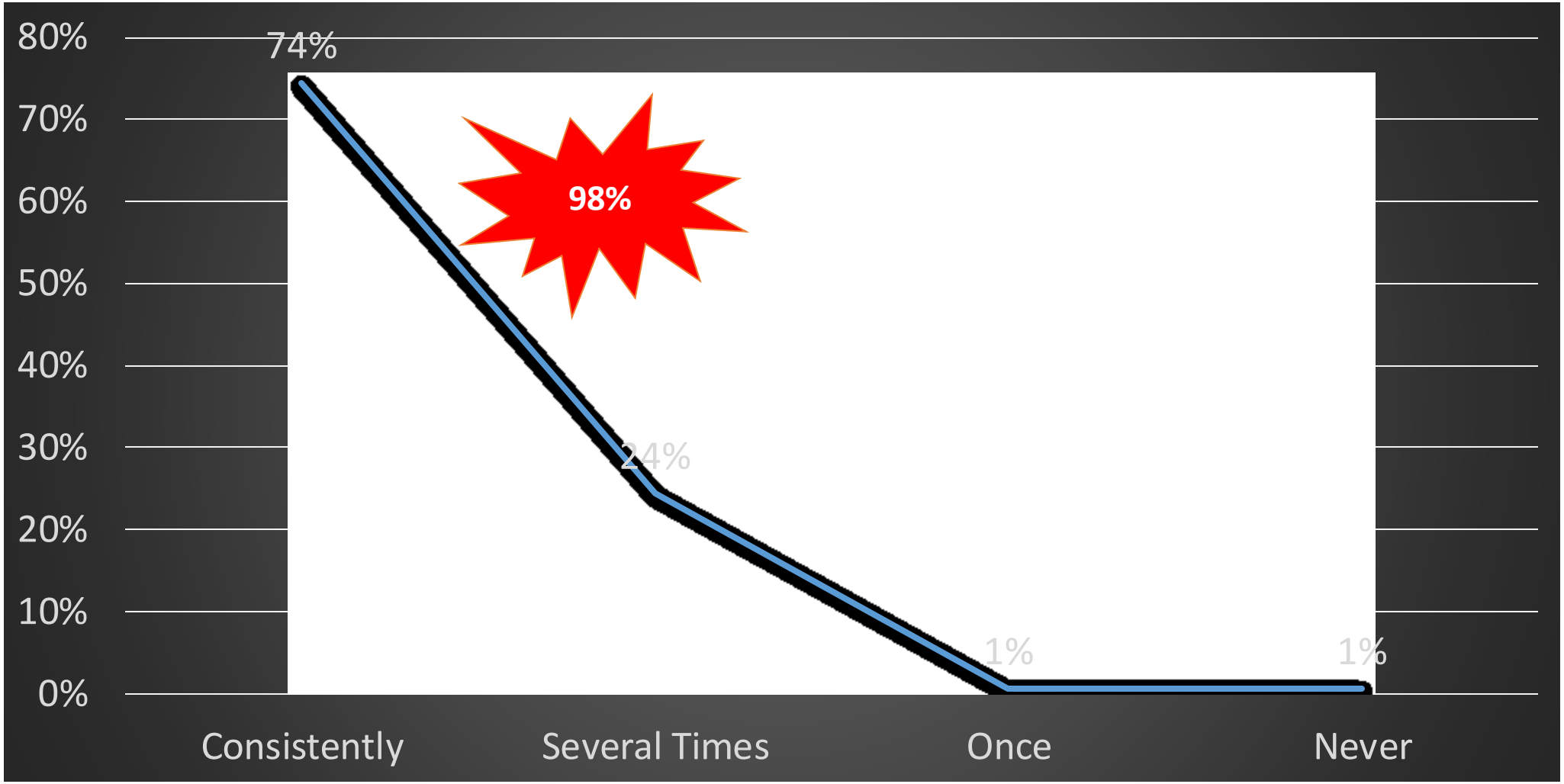
Your smartphone?



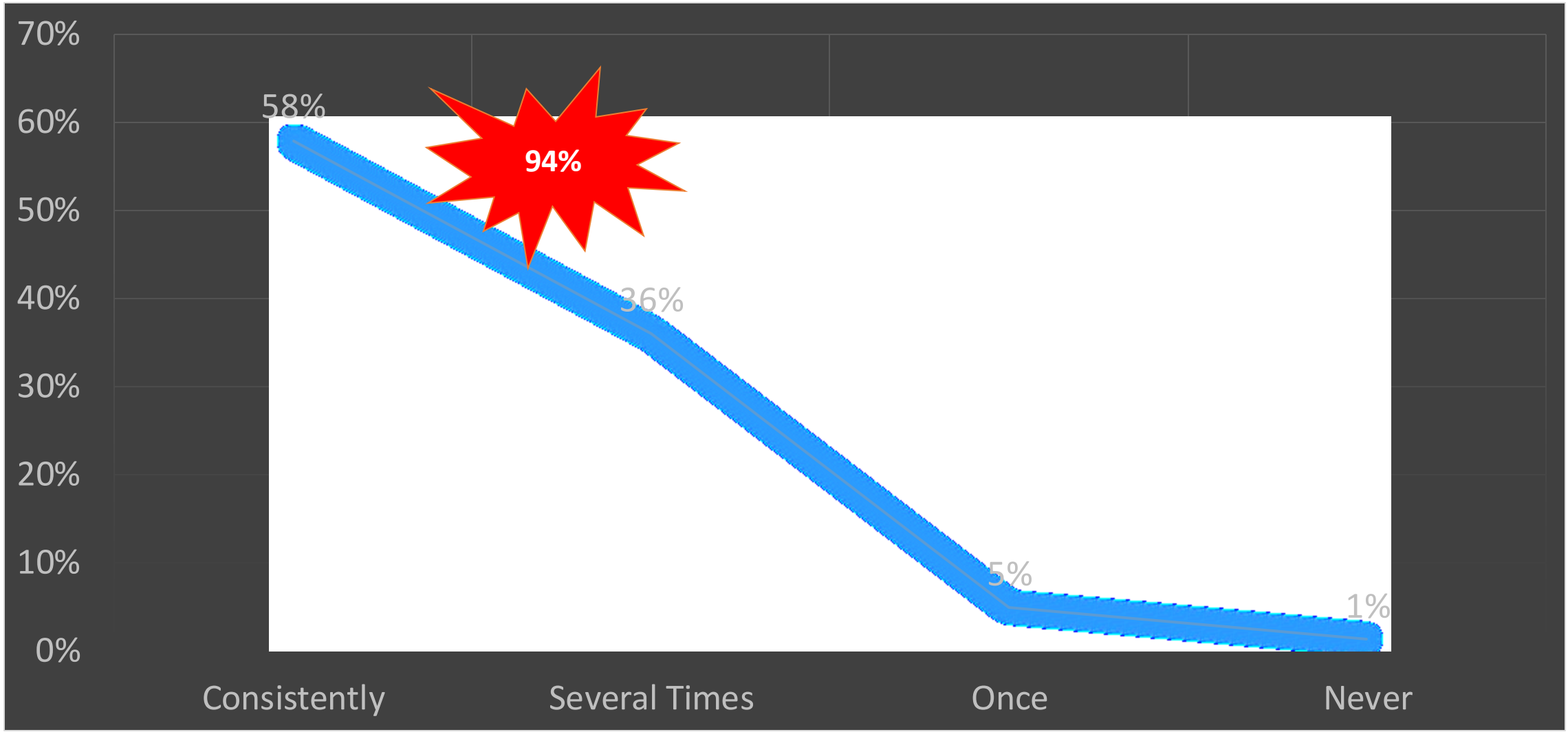
Social media (Facebook, Instagram, etc.) Daily?



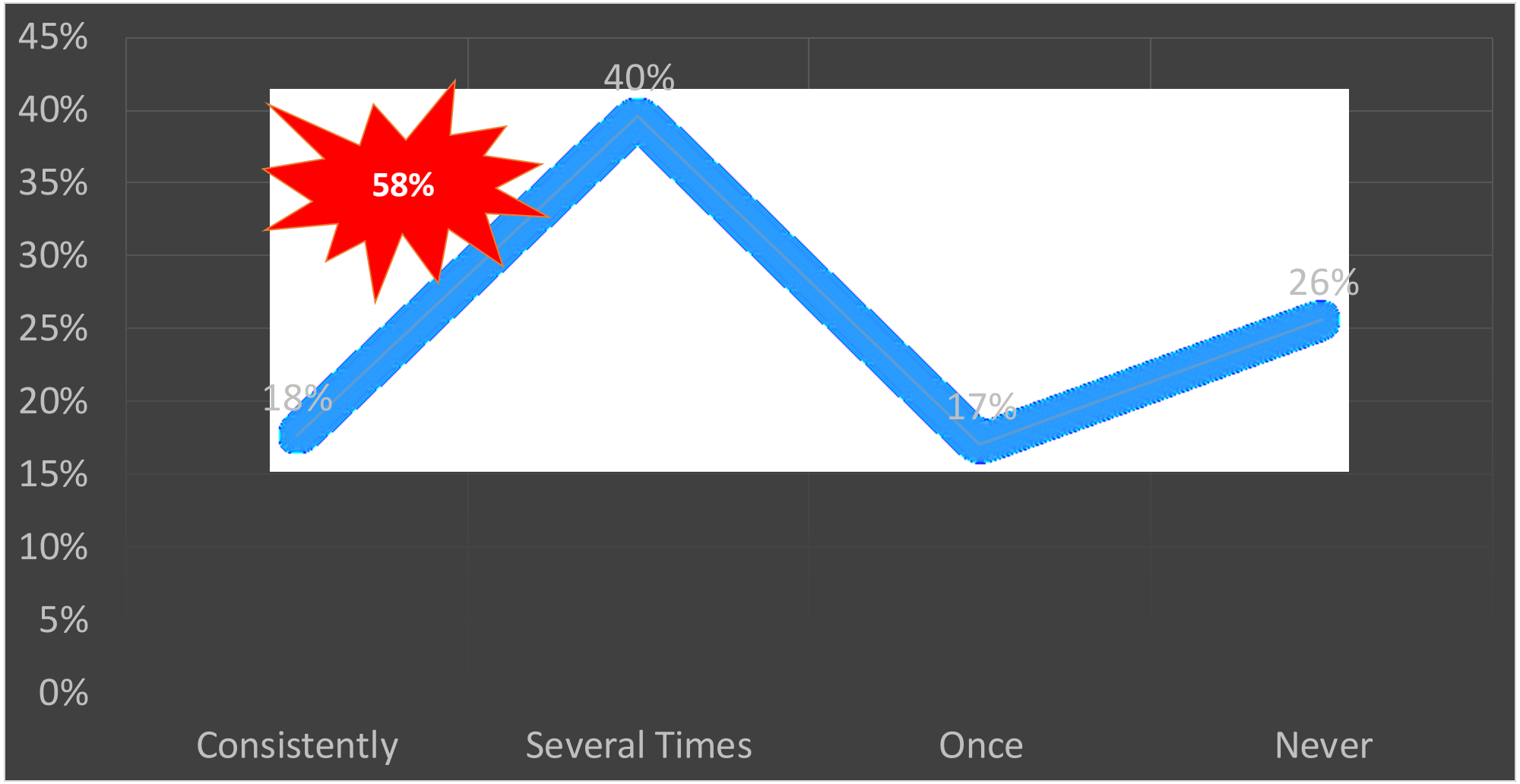
Instant messenger (WhatsApp, Line, Telegram, etc) Daily?



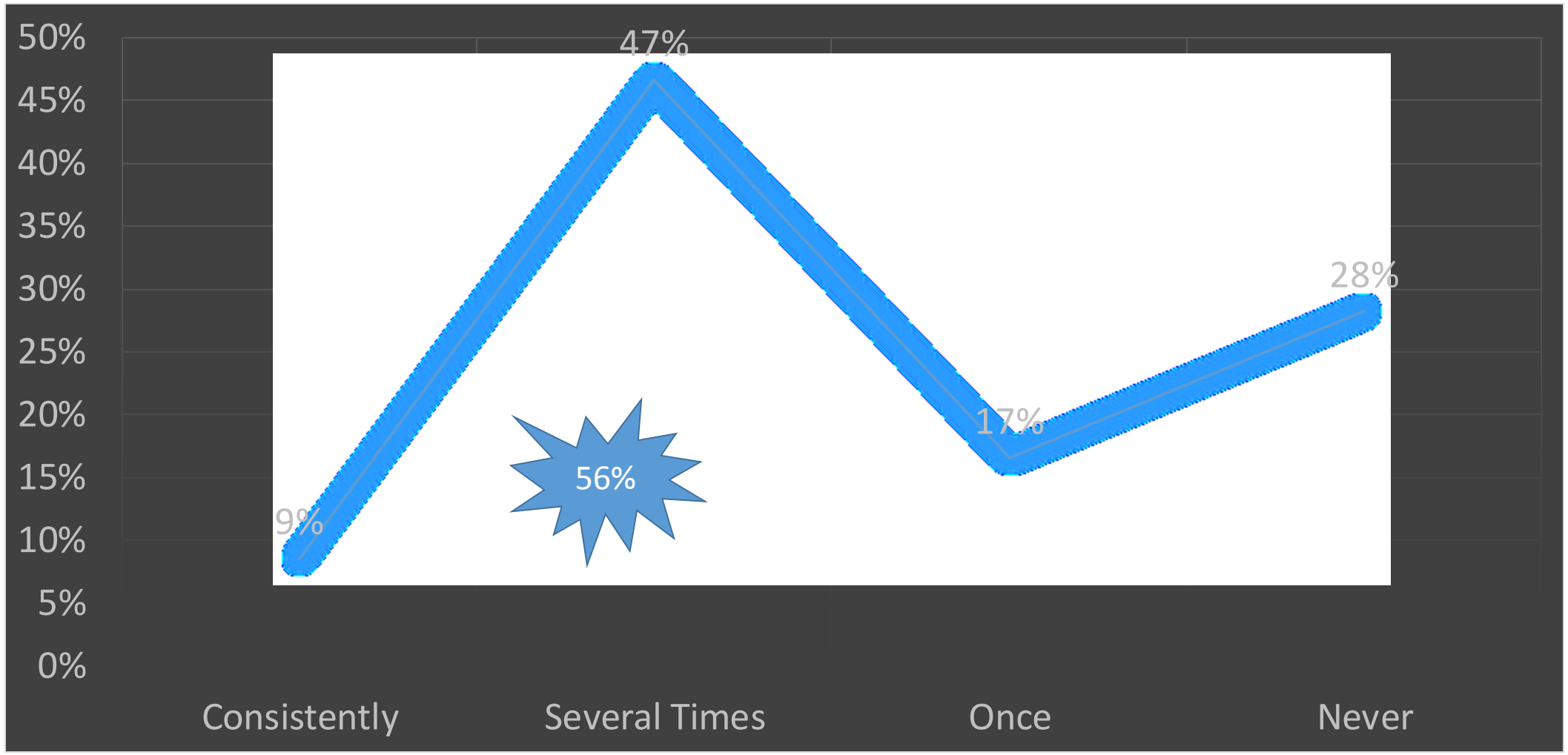
Music / Video streaming daily?



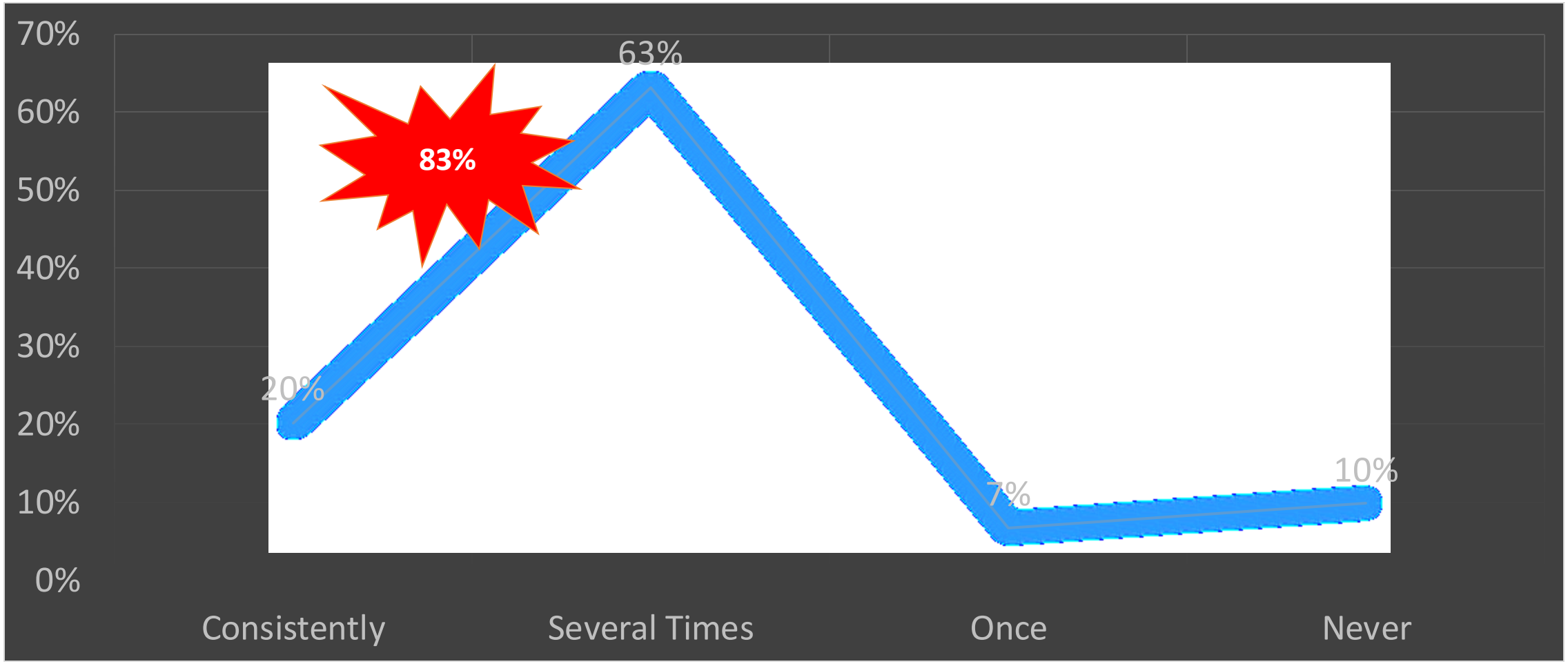
Online game Daily?



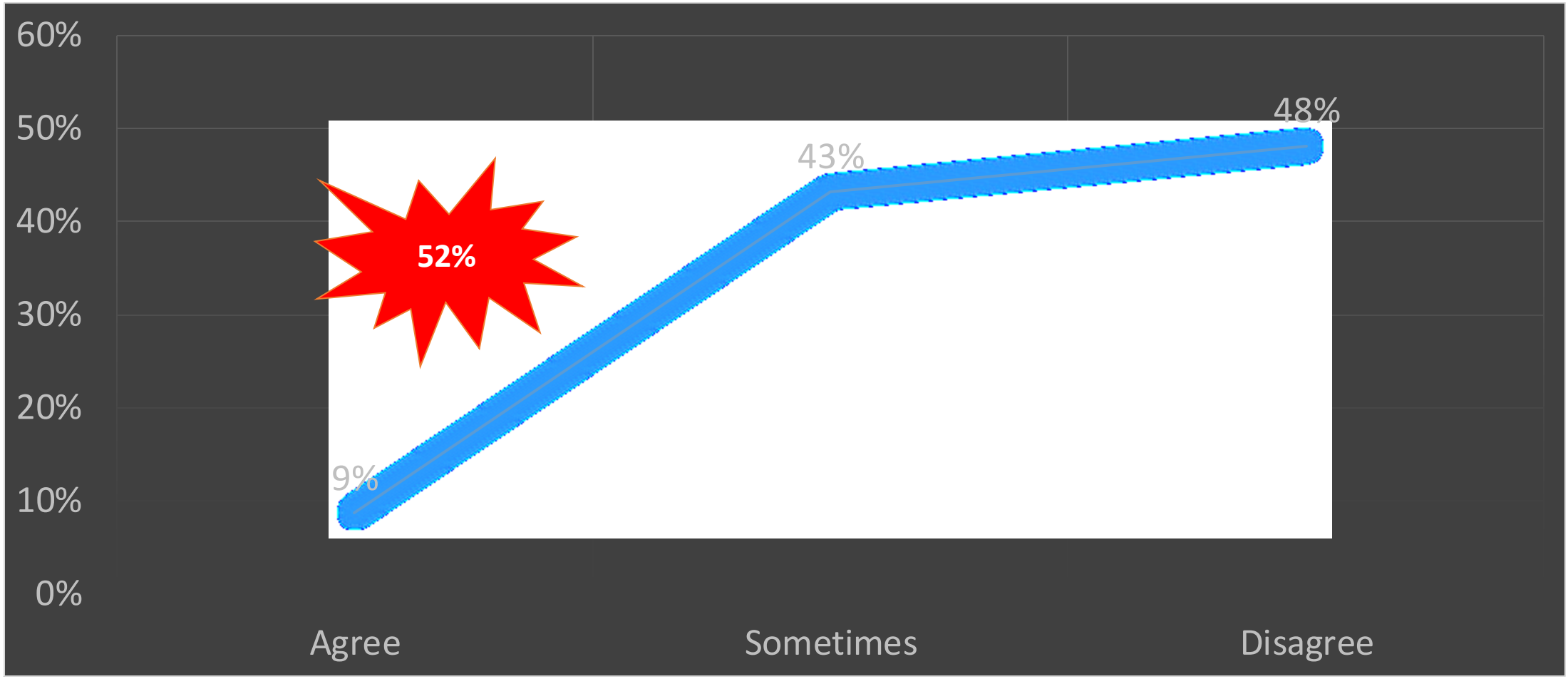
e-news / e-book / e-learning Daily?



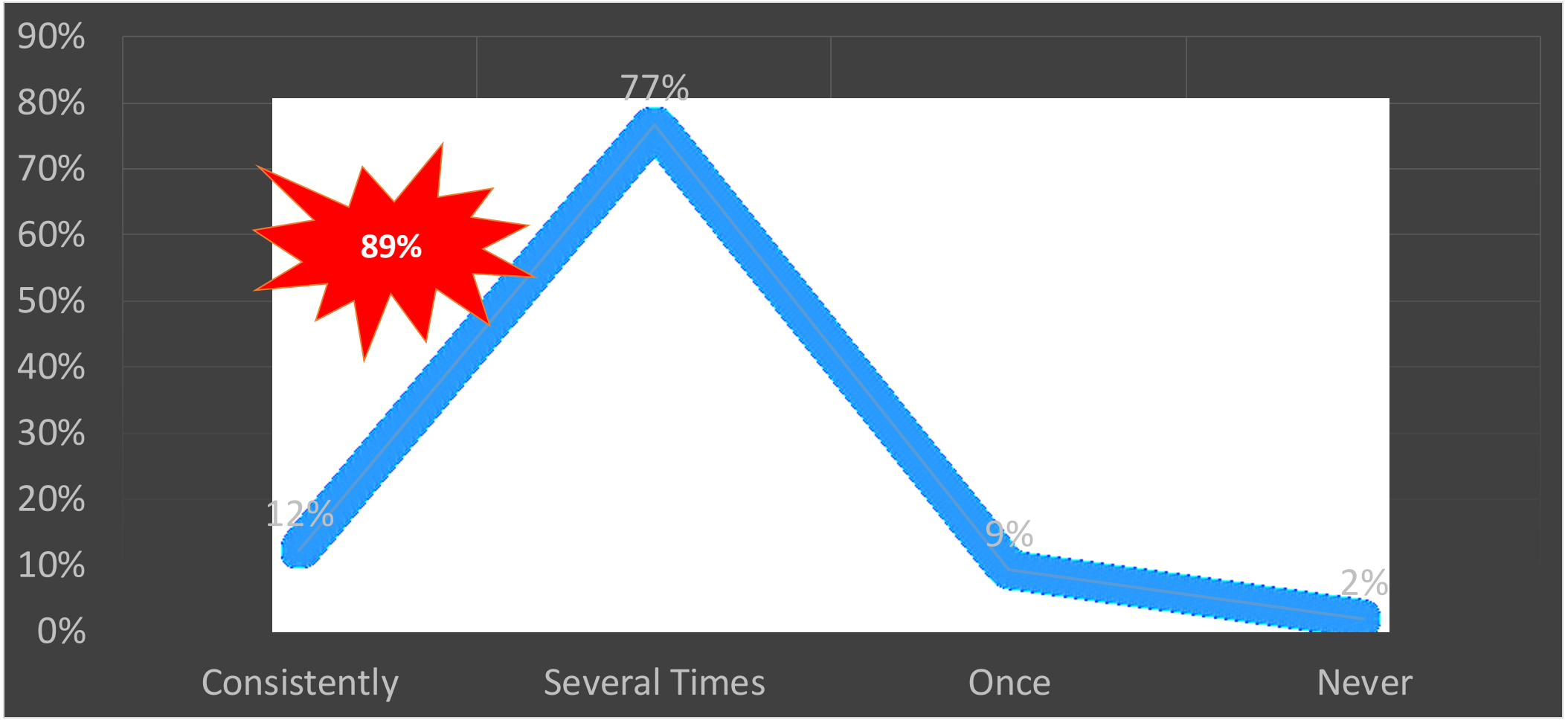
I use smartphone at transport



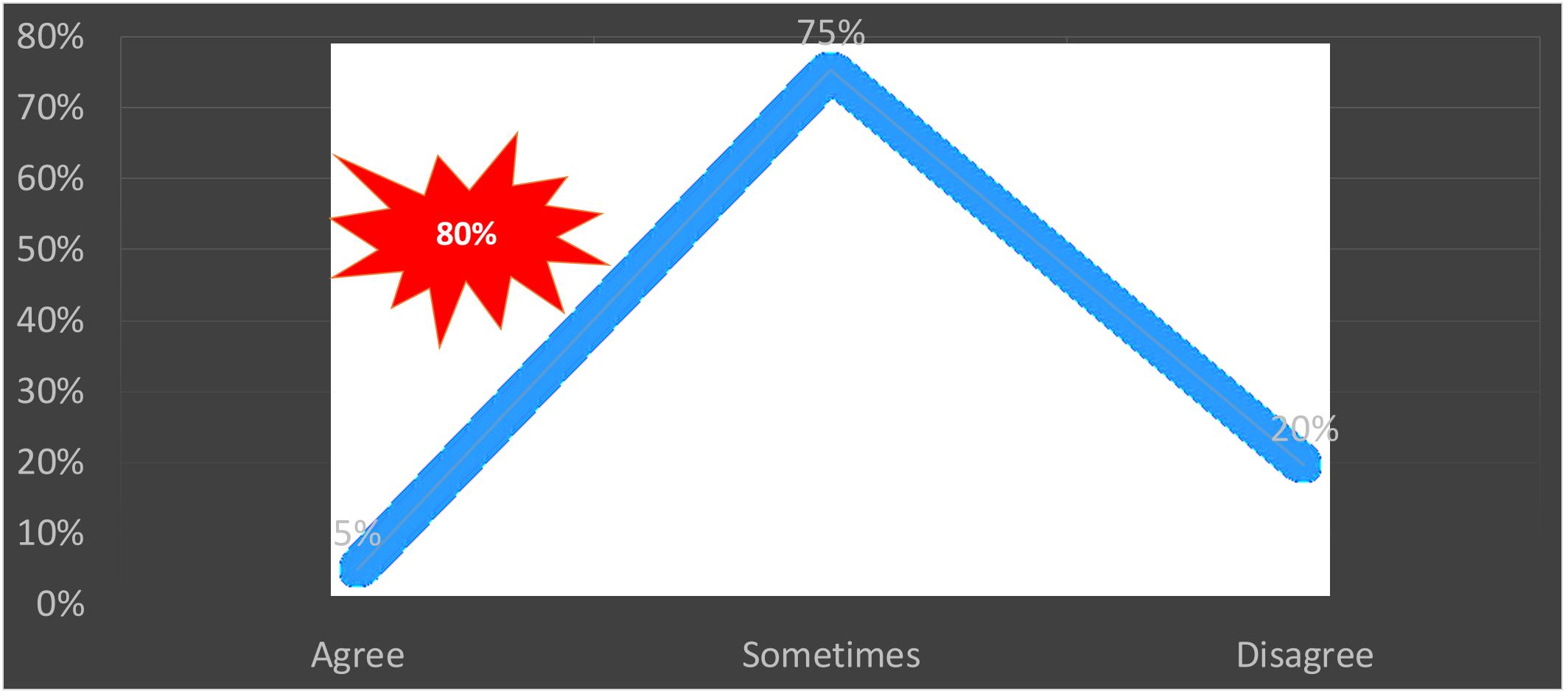
Do you answer call while driving?



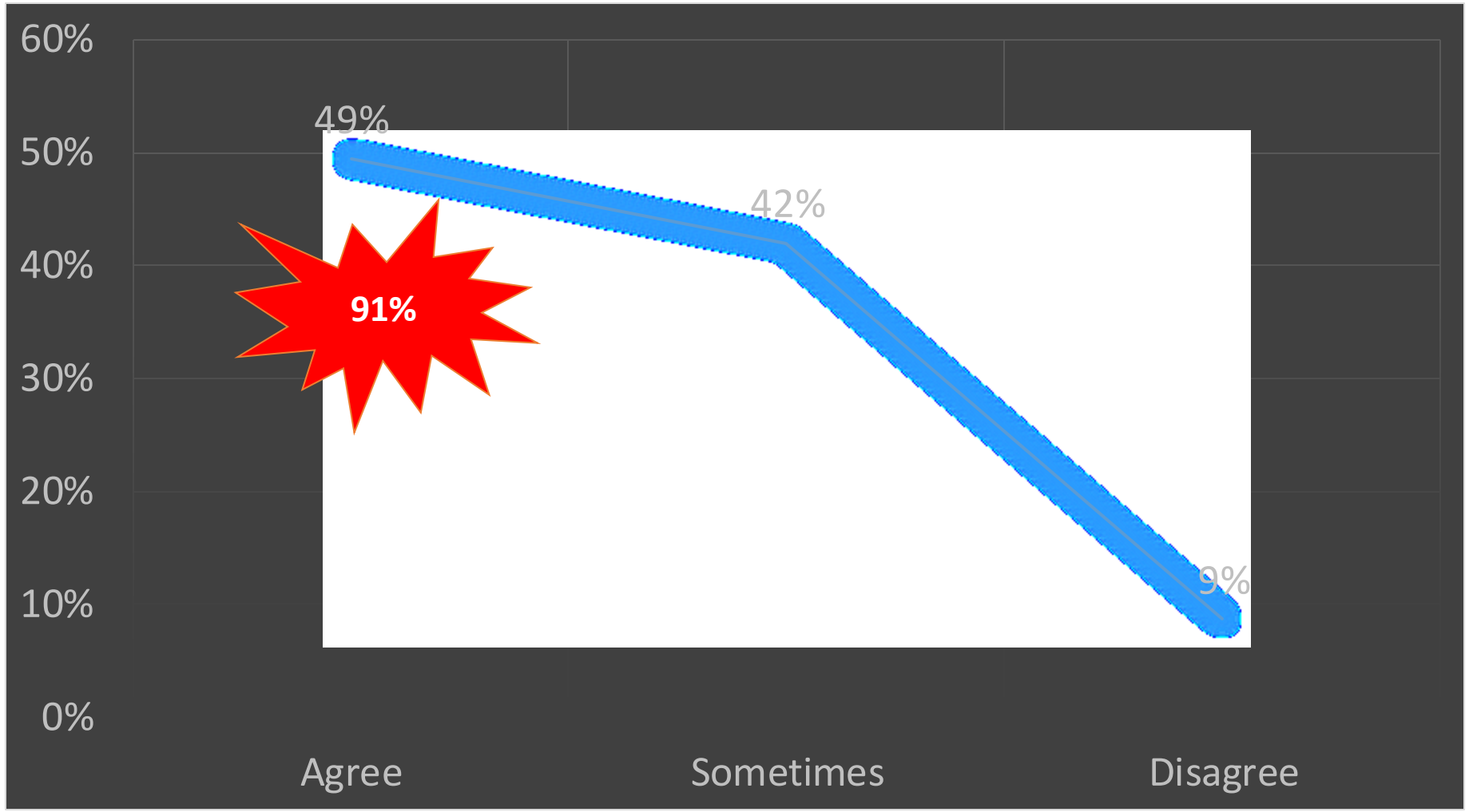
I use smartphone at classroom / workplace



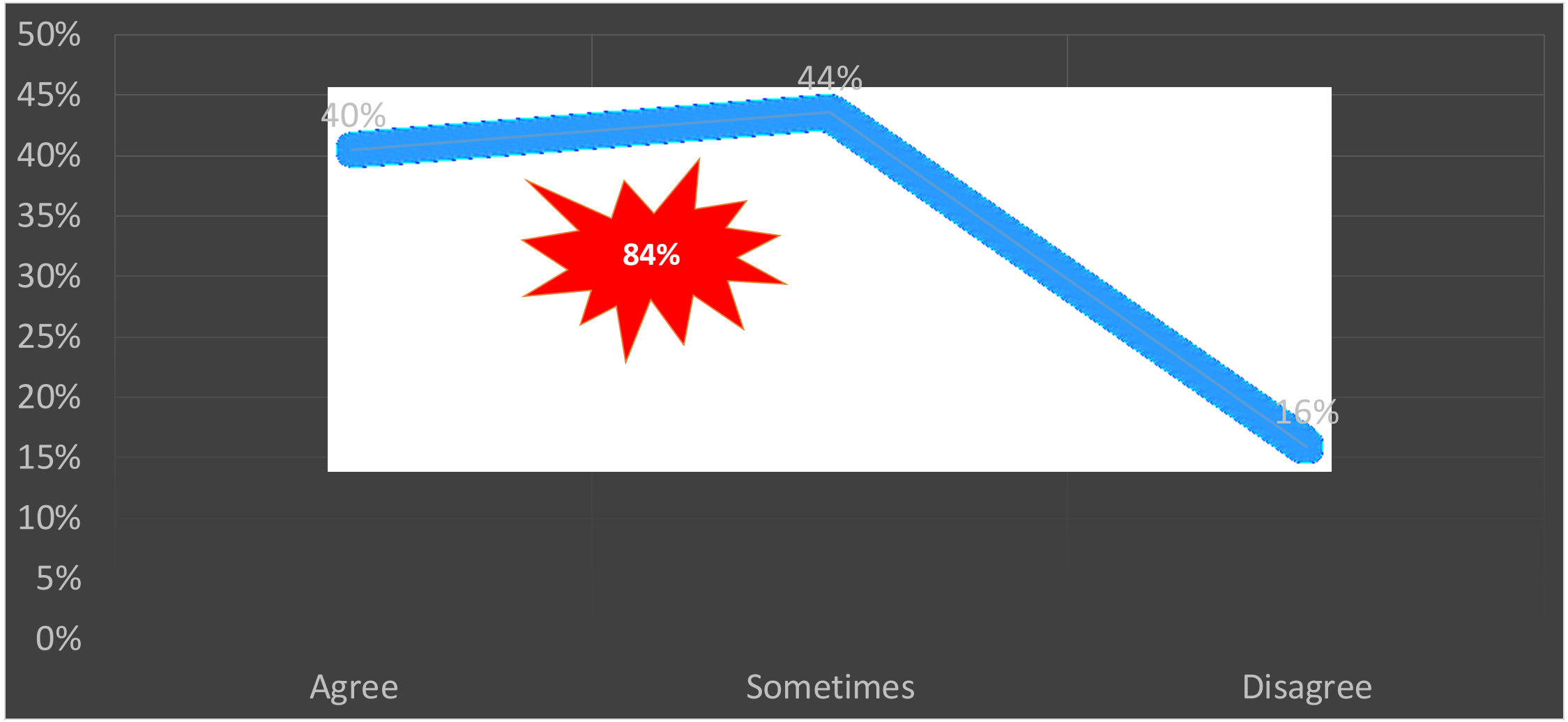
Do you check and use your smartphone during face-to-face interactions?



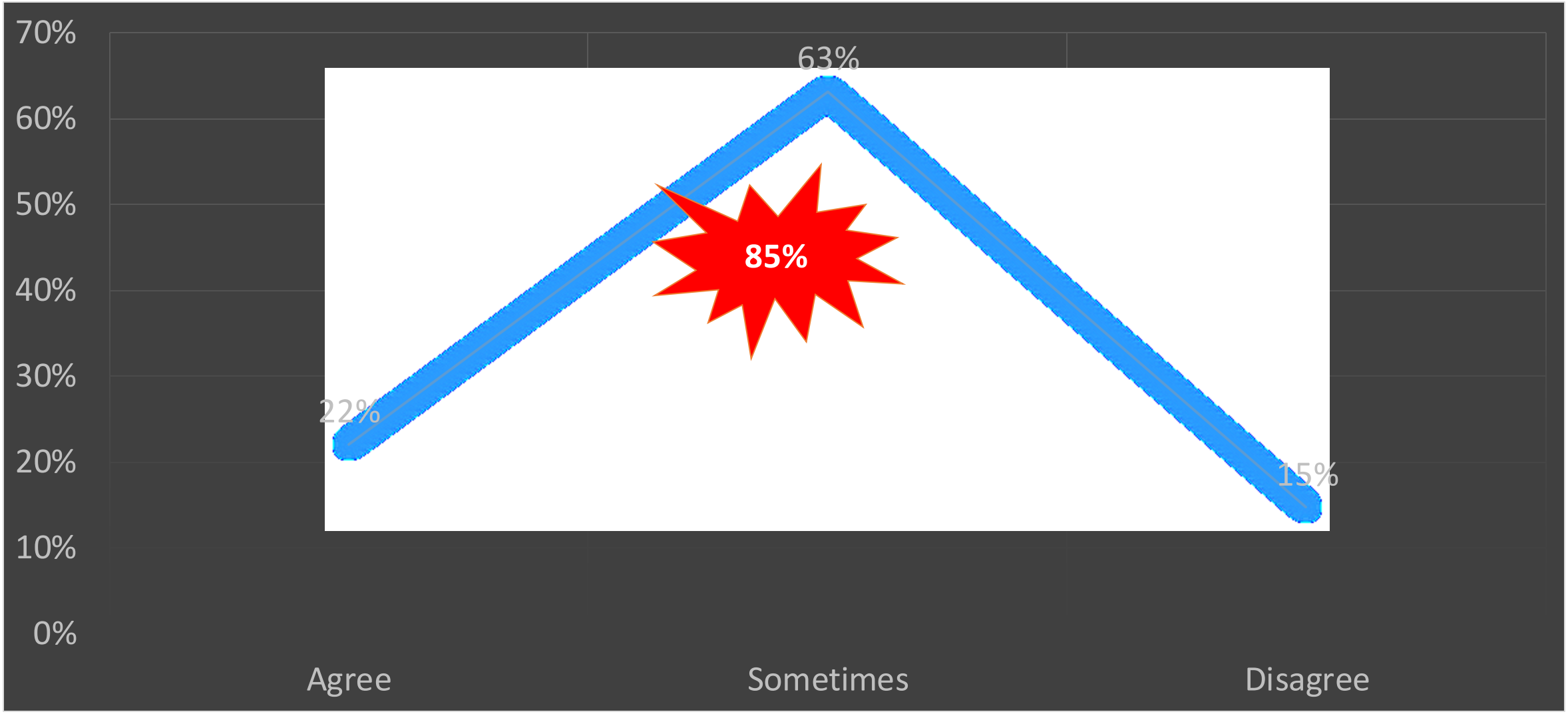
Do you check your smartphone at times without any reason?



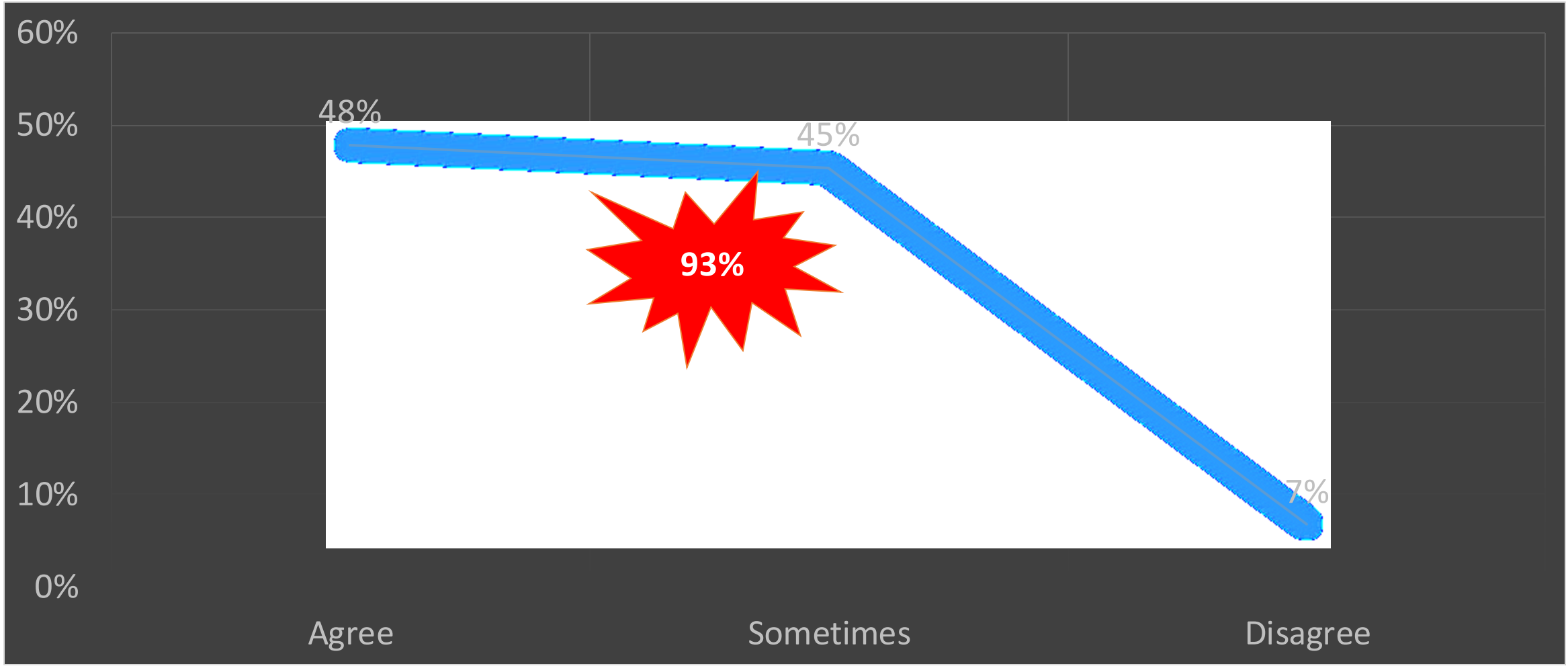
I cannot live without my smartphone



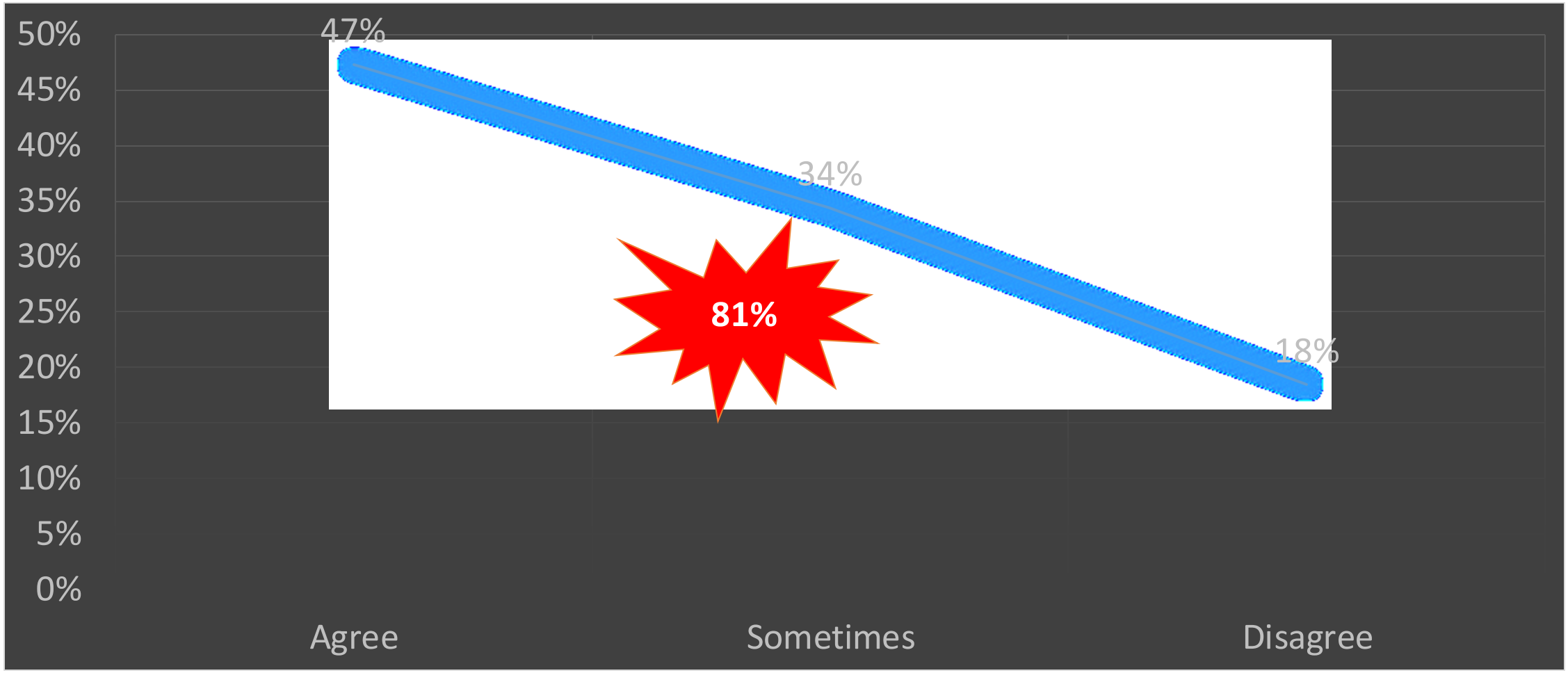
I feel happier when I am using smartphone



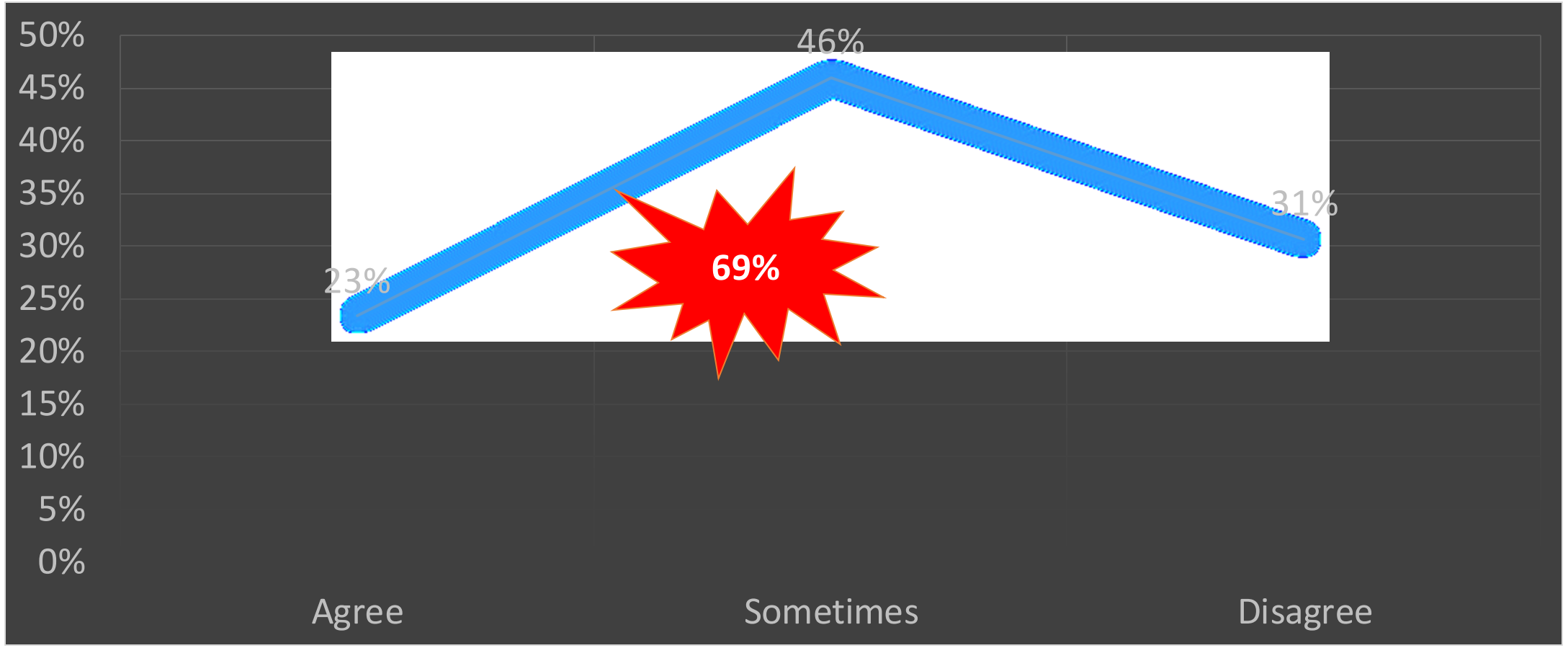
I can get frustrated / annoyed if I cannot find my smartphone or no internet connection



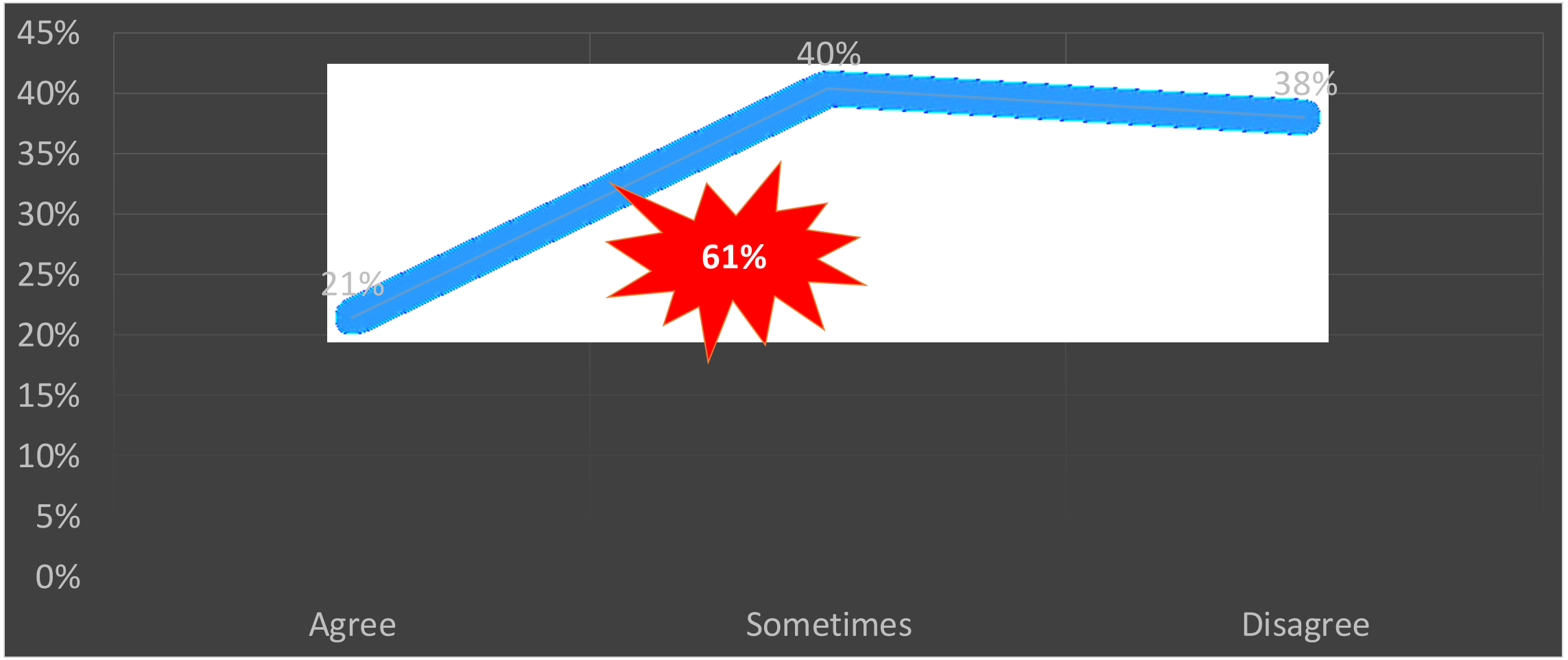
I get insecure going out without my phone



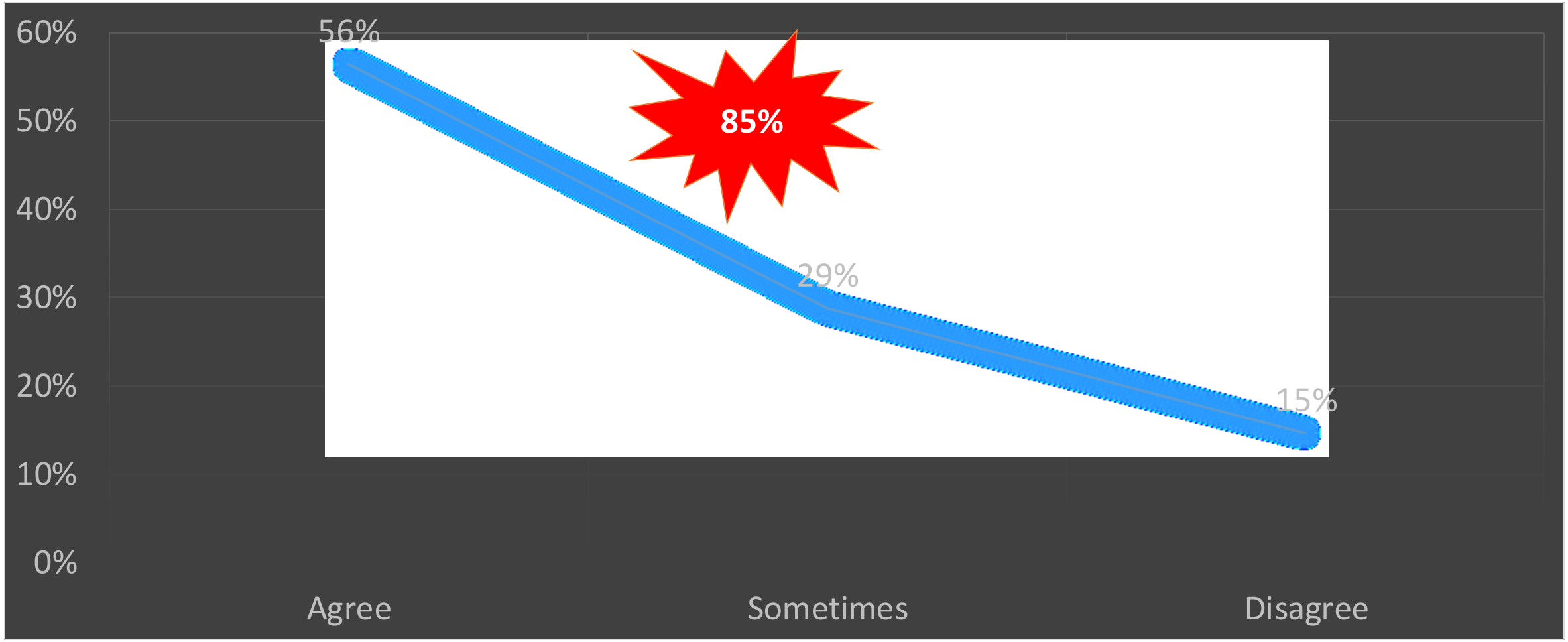
I experience shoulder pain, headache or dry eyes from spending too much time on my smartphone



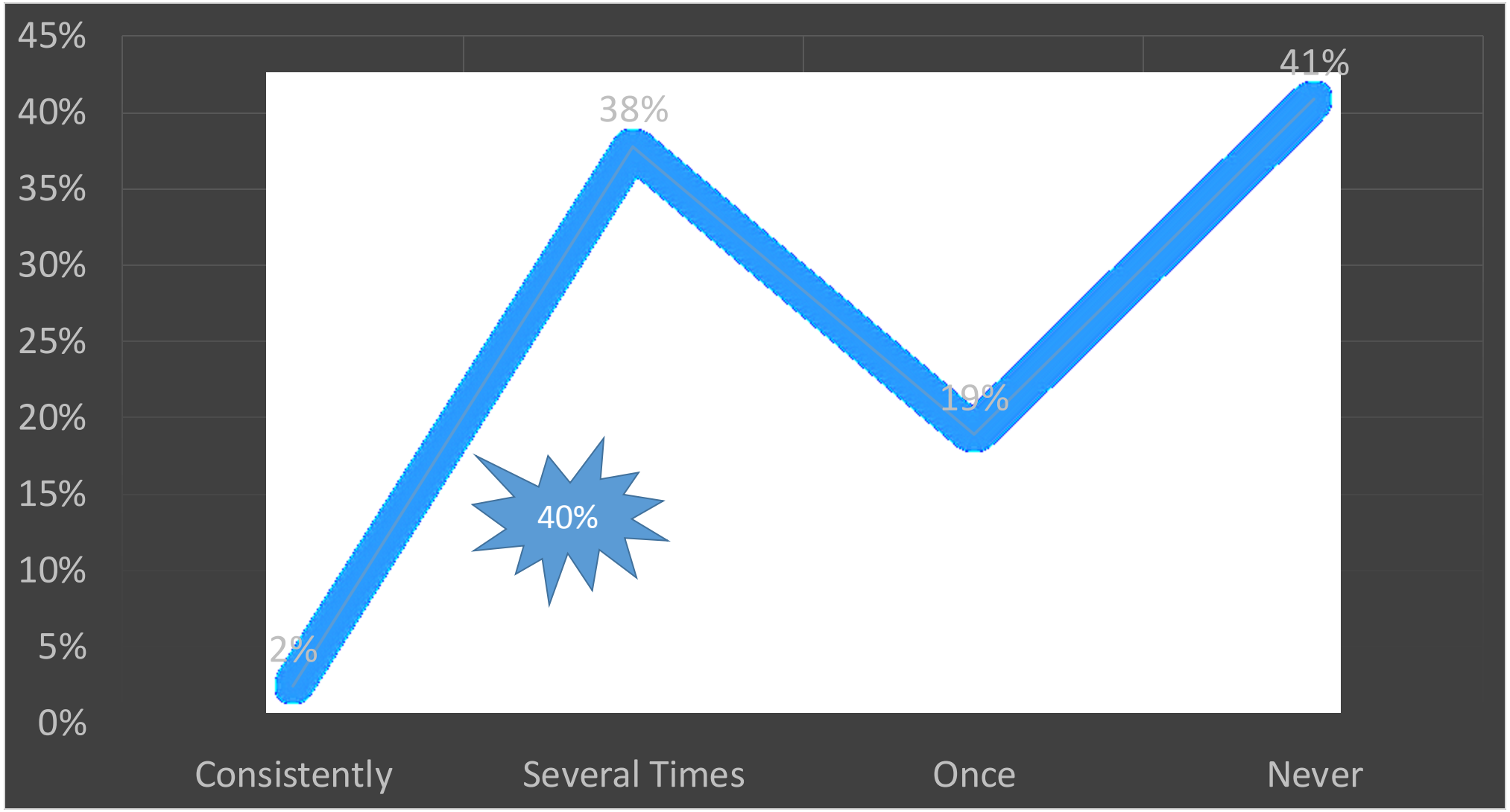
I experience dizziness from staring at my smartphone for too long



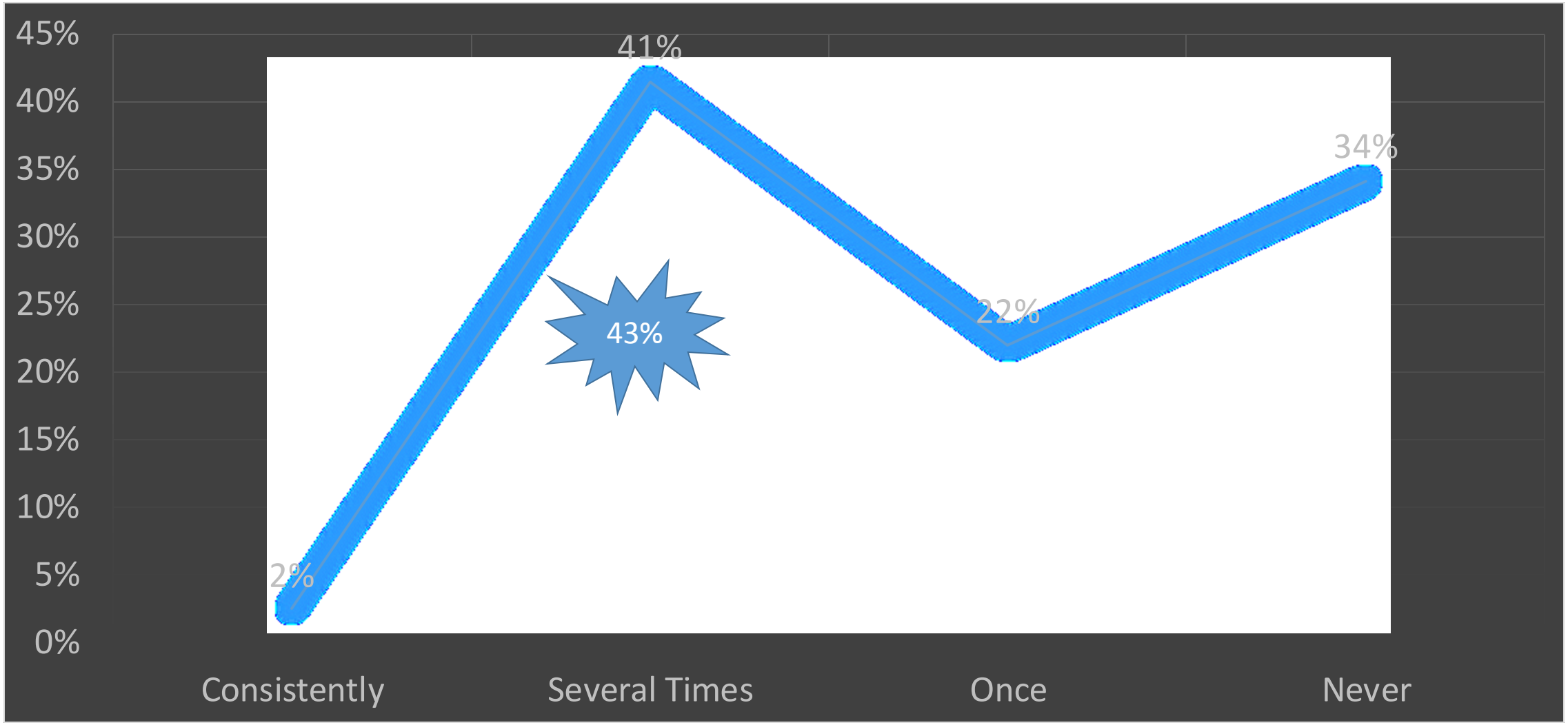
Using smartphone before bed can cause sleep problems

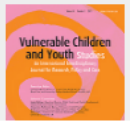


Payment using Apps Daily?



Mobile Commerce or Shopping online Daily?





Journal
Vulnerable Children and Youth Studies ›
An International Interdisciplinary Journal for Research, Policy and Care
Volume 14, 2019 - Issue 3

Articles

Smartphone addictions and nomophobia among youth

Muhammad Anshari, Yabit Alas & Exzayrani Sulaiman

Pages 242-247 | Received 17 Sep 2018, Accepted 16 Apr 2019, Published online: 06 May 2019

ABSTRACT

Nomophobia is a form of behavioral addiction towards smartphone referring to the

Computers in Human Behavior
Volume 64, November 2016, Pages 719-727

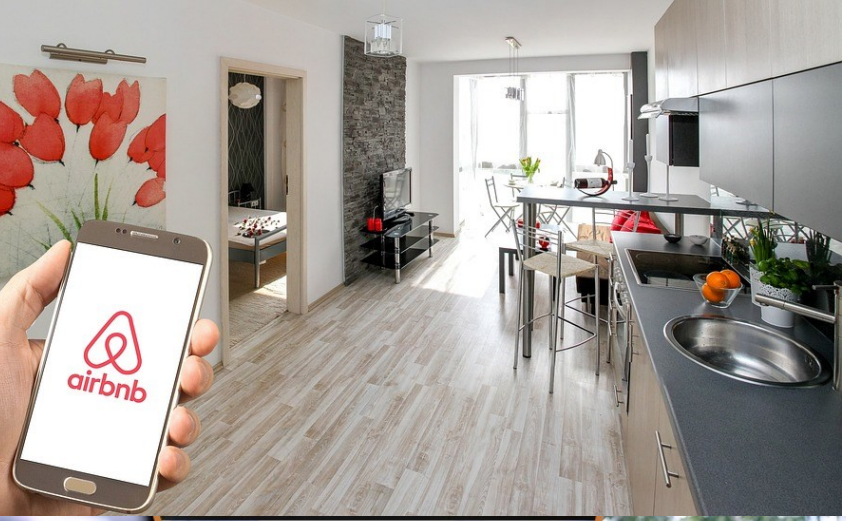
Full length article

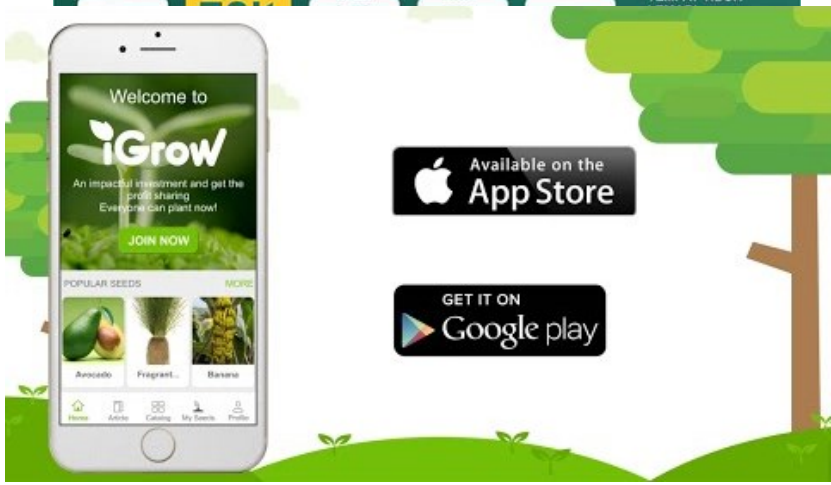
Smartphone habit and behavior in Brunei: Personalization, gender, and generation gap

M. Anshari, Y. Alas, G. Hardaker, J.H. Jaidin, M. Smith, A.D. Ahad

Show more

https://doi.org/10.1016/j.chb.2016.07.063





Digital Transformation is reinventing the ways many businesses operate

Technology is now creating **new business model**, your smartphone is no longer just mobile phone, it's also **payment provider**.

H&M says to close more stores as customers go online

Agence France-Presse / 01:30 PM December 20, 2017

Business

1,100 retail store closures and counting: tracking the high street's miserable start to 2018

share

Save 31

Now

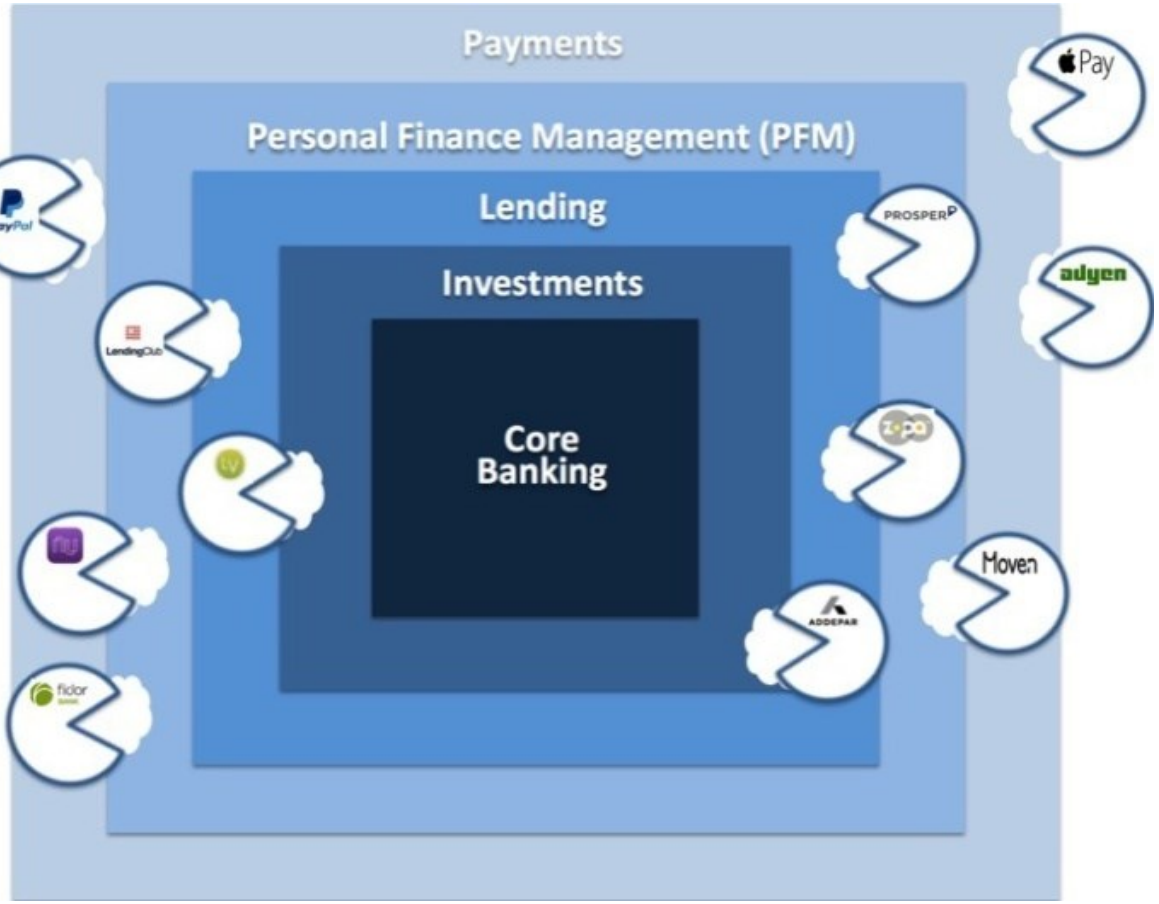
Richard Kestenbaum Contributor
Retail

high streets

Internet shopping and weak pound bite as consumer confidence and wages fall

Future Disruptions In Transportation -- 2014 And Beyond

Strategyand Contributor
Strategy&, part of the PwC network



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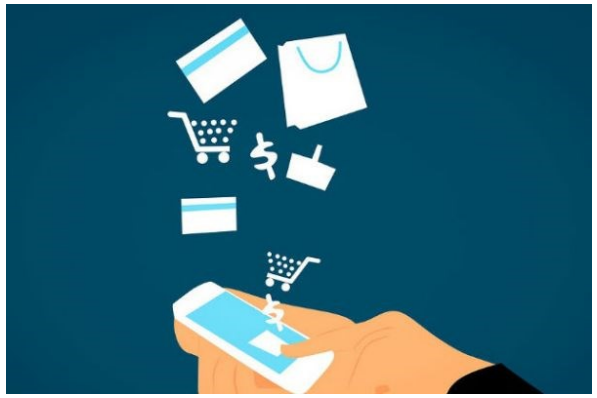
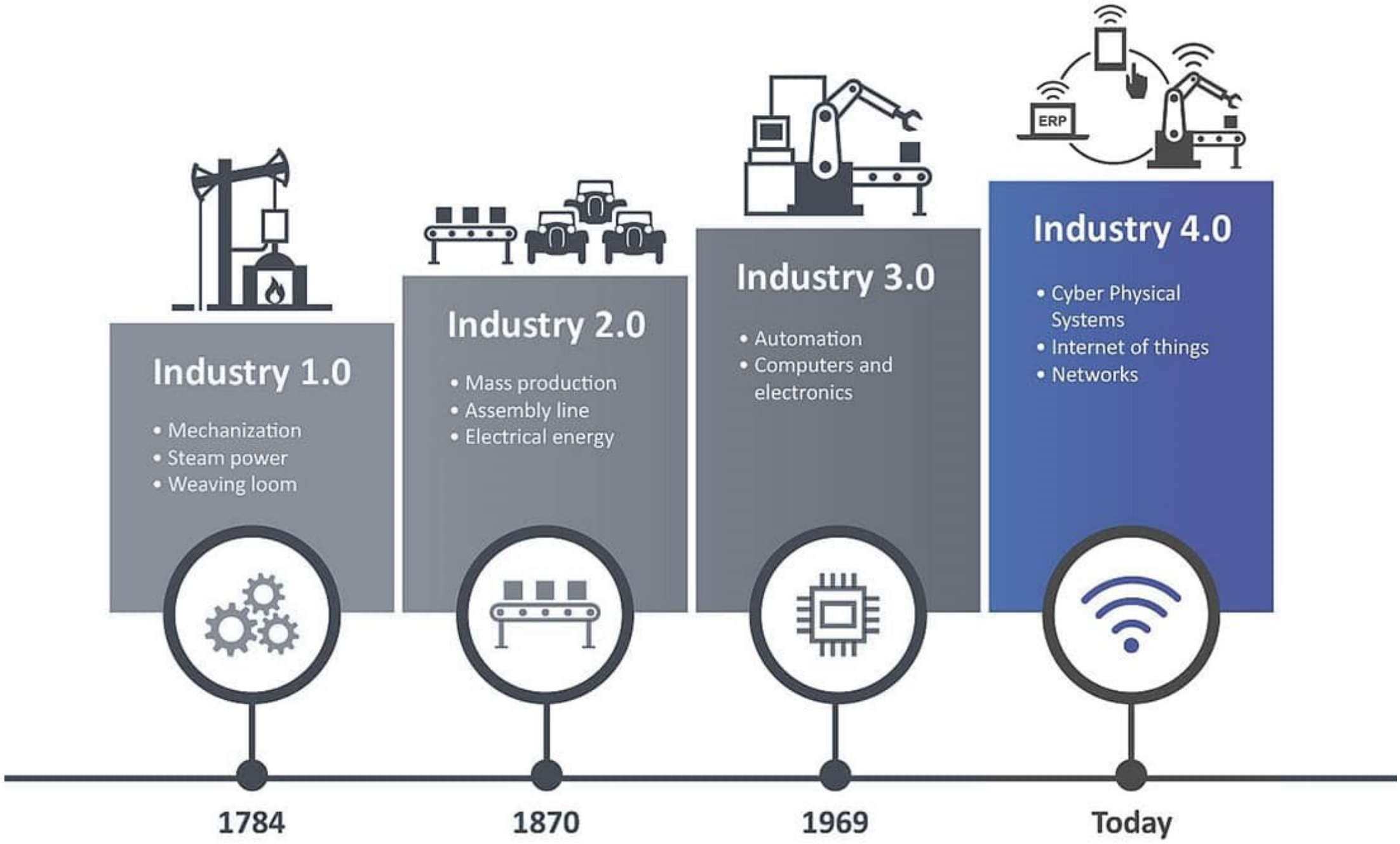
Banyak Toko Ritel Tutup, Pola Belanja Masyarakat Berubah

Ridho Insan Putra
02 Jan 2018, 16:23 WIB

Share 10



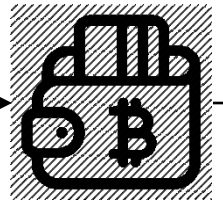

Industry 1.0
• Mechanization
• Steam power
• Weaving loom
Industry 2.0
• Mass production
• Assembly line
• Electrical energy
Industry 3.0
• Automation
• Computers and electronics
Industry 4.0
• Cyber Physical Systems
• Internet of things
• Networks
ERP
1784
1870
1969
Today

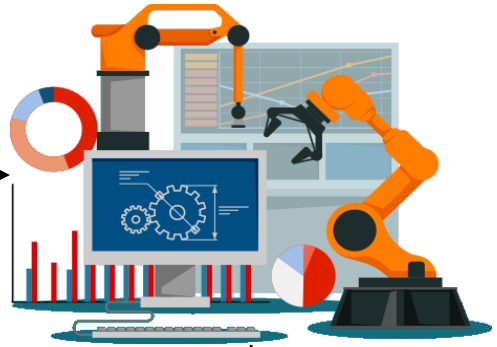
Sample of Cyber – Physical Systems

Online order
Customization, personalization
On demand production

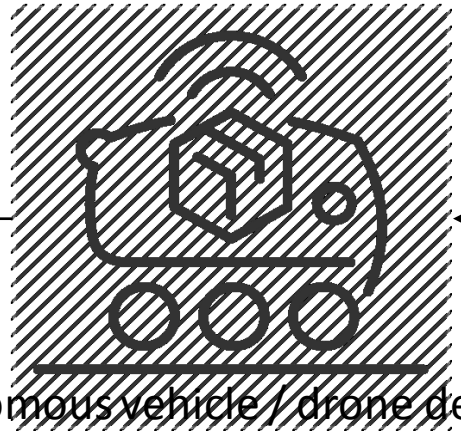
FinTech
eWallet, ePayment

Smart Factory n1, 2, 3…
Smart grid, dark factory





i.e. 15 minutes Process from order to manufacture



Autonomous vehicle / drone delivery

Powered by

Internet of Things,
Big Data,
AI, Sensor, 3D,
Cloud Computing
Etc.

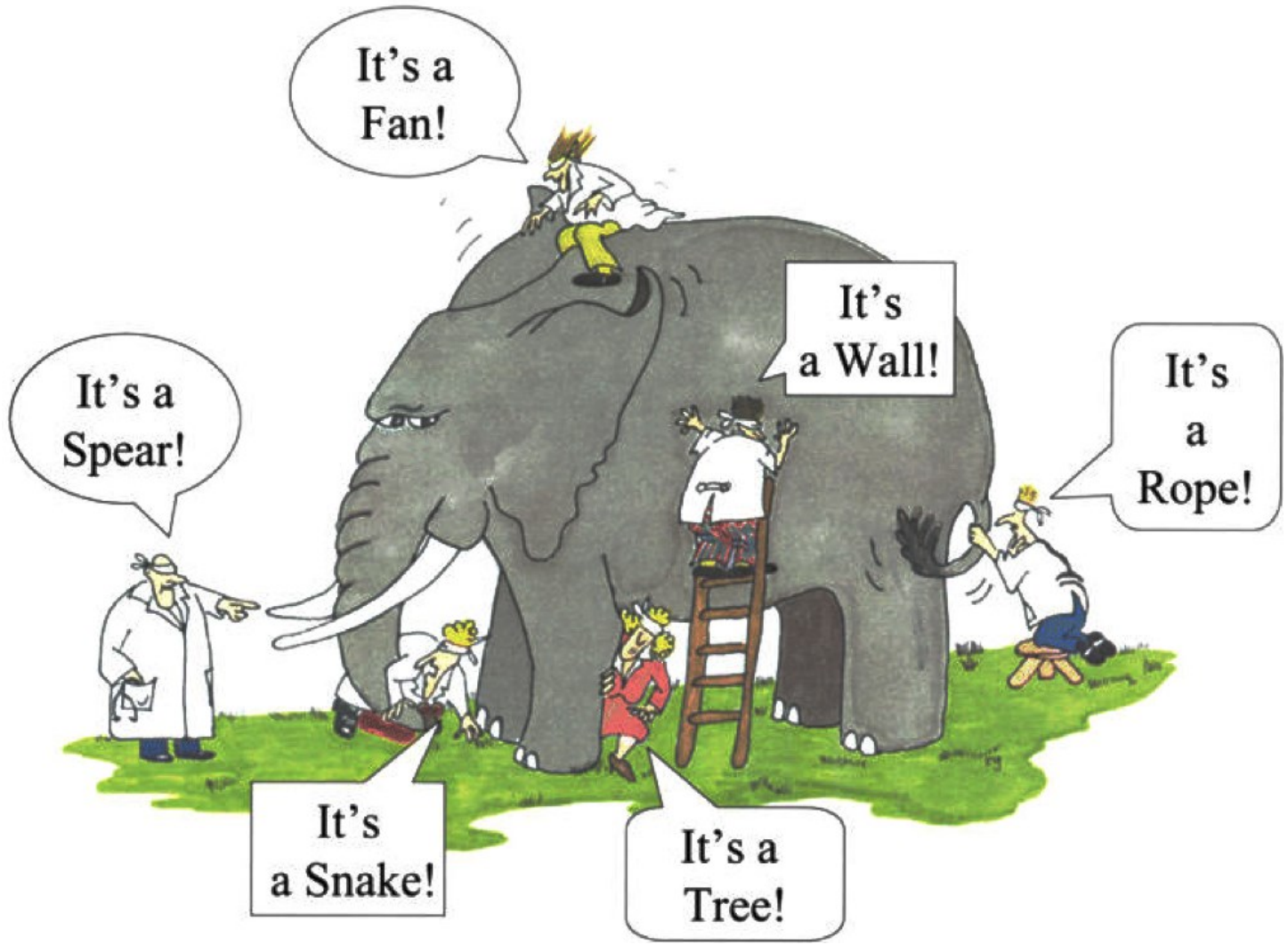
The world's most valuable resource is no longer oil, but data
Economist, 2017

Data Driven Companies

THE TOP 10 BEST-PERFORMING COMPANIES IN THE WORLD, 2019

CEOWORLD Magazine

1. Apple: $961.3 billion
2. Microsoft: 946.5 billion
3. Amazon: 916.1 billion
4. Alphabet: 863.2 billion
5. Berkshire Hathaway: 516.4 billion
6. Facebook: 512 billion
7. Alibaba: 480.8 billion
8. Tencent Holdings: 472.1 billion
9. JPMorgan Chase: 368.5 billion
10. Johnson & Johnson: 366.2 billion


It's a Fan!
It's a Spear!
It's a Wall!
It's a Rope!
It's a Snake!
It's a Tree!

Just a few facts…

- More data has been created in the past 2 years than in the entire history of the human race

- **Every second** we create **new data**. 40,000 searches on Google alone are made every second for a total of 1.2 trillion searches per year.

- By 2020 1.7 megabytes of new data will be created every second for every human on the planet.

- For a typical Fortune 1000 company just a 10% increase in **data accessibility** will result in more than $65 million additional **net income**.

Source: http://www.forbes.com/sites/bernardmarr/2015/09/30/big-data-20-mind-boggling-facts-everyone-must-read/#7d8cd4b6c1d3

Volume, Velocity, Variety & Value

Soon there will be over 2 billion people on the web

By 2010, there will be 1 billion transistors per human

China sends more text messages in a week than the U.S. does in 1 year

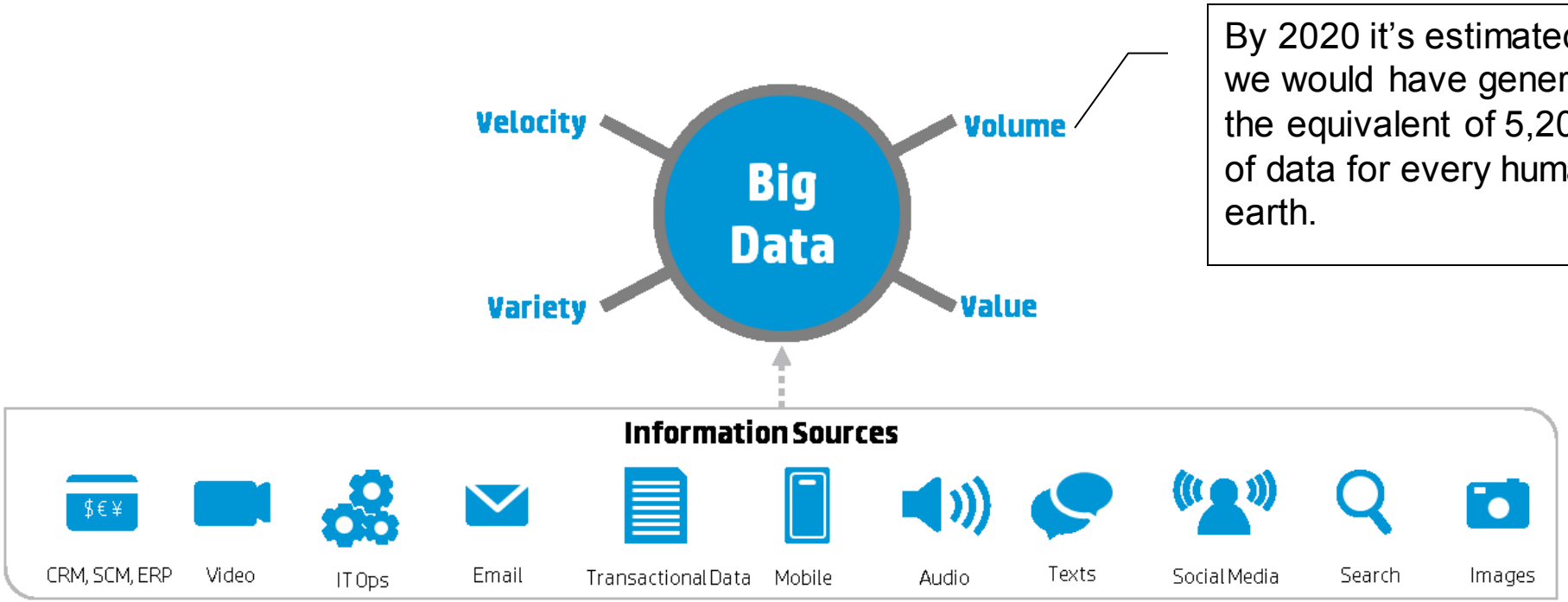
By 2011 there will be trillions of interconnected objects – cars, planes, cameras, roadways, pipelines - forming an "Internet of Things"

By 2010, there will be 30 billion RFID tags in circulation

There are 1 billion camera phones in use today

How big is the Big Data

"Big Data are high-volume, high-velocity, and/or high-variety **data assets** that require new forms of processing to enable ***enhanced decision making***, insight discovery and process optimization" (Gartner, 2012)



By 2020 it's estimated that we would have generated the equivalent of 5,200 GB of data for every human on earth.

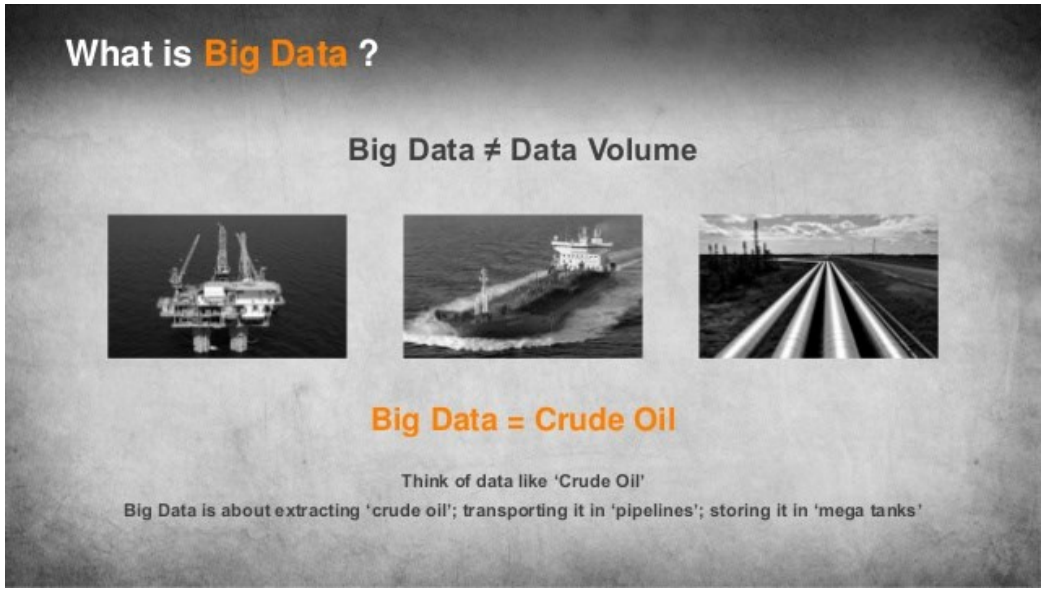
Harvesting any resource requires Mining, Refining and Delivering

Big Data is the next Natural Resource

"We have for the first time an economy based on a key resource (Information) that is not only renewable, but self-generating.

Running out of it is not a problem, but drowning in it is."

— John Naisbitt

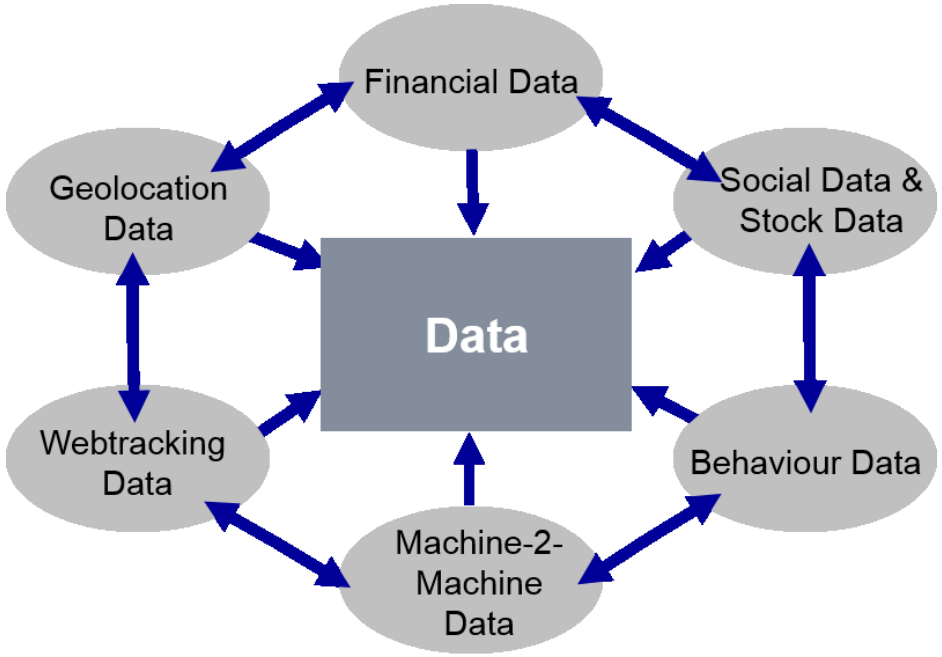


In the data-driven economy, data has become a **critical asset** for the development, similar to the **natural resources** and **human capital**. In fact, economic activities have long relied on data accuracy and reliability, whether it is census data, climate data, satellite images, transport data, health data, research data, logistic data, energy consumption data, and any data relates to economic transactions that can stimulate innovation on new business opportunities, accelerate business transactions, and produce knowledge sharing.

Our digital footprint → defines us

where we leave all our digital footprints voluntarily either from social networks, website visit & click LIKE, web log, e-commerce transaction, CCTV, GPS, RFID, smart devices, and all source of data that is forming our pattern, habit and behavior. Everytime we perform a search, tweet, send an email, post a blog, accessing GPS while driving, comment on Facebook, use a cellphone, shop online, update profile on social medias, use a credit card, or even travelling using Waze, we leave behind a huge amount of data, a digital footprint that provides a treasure of data about our lifestyle, financial behavior and activities, health habits, social interactions patterns, and much more.

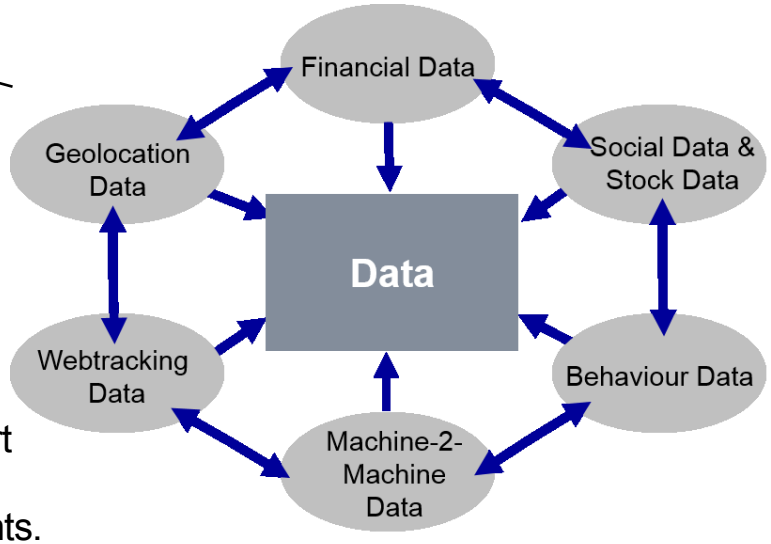
Sample of Big Data Analytic in Starbuck



Starbuck

*determine
their future
store locations
*map out local
trade areas
*retail clusters
*area
demographics

Place customers tend to
spend a higher average
amount of money for products



*which products are selling to
which individual customer
demographics

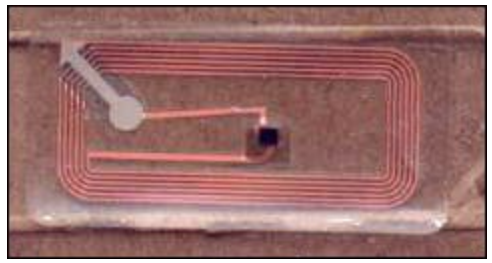
*able to analyze areas with
high concentrations of smart
phones to release mass-
quantity app-based discounts.
*They have also used
weather pattern data to
create Frappuccino
promotions that coincide with
oncoming heatwaves.

*traffic patterns
*transportation nodes

*Using in-store sales data &
interviews with baristas
*loyalty cards to track specific
individual buying data
*send mobile coupons and
promotions towards customers
who are showing tendencies of
not repurchasing at Starbucks.

RFID Tags

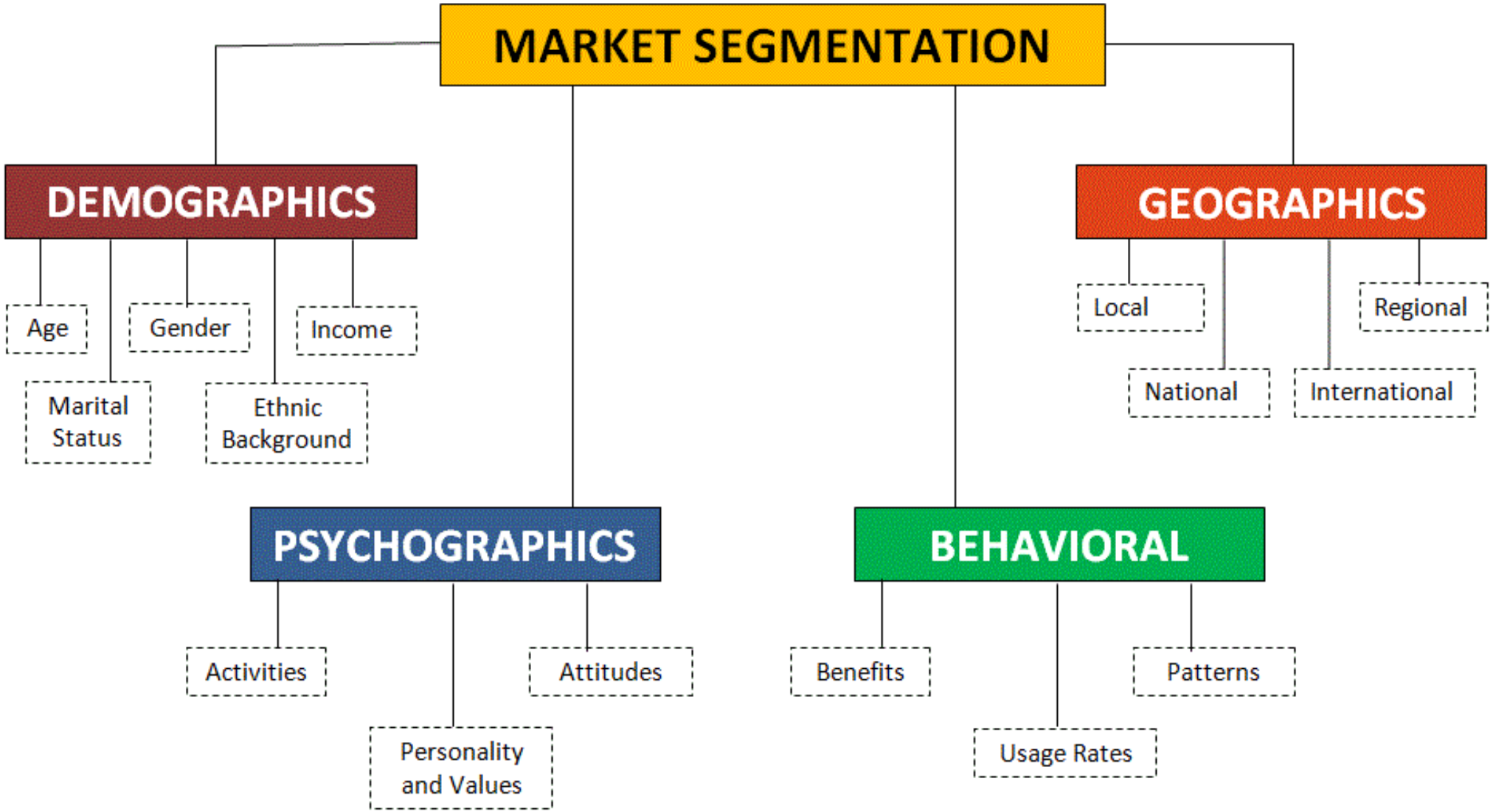
- Some products they really hide inside the box that is no means for **customers to notice that they are being watched**.
- RFID tags on products can be used to collect personal data on buying behavior without the buyers' knowledge.
- For instance, The Gillette Co. has ordered 500 million radio-frequency identification tags from Alien Technology Corp as little as 5 cents each. (Source; informationweek)



Big Data & Behavioral Science

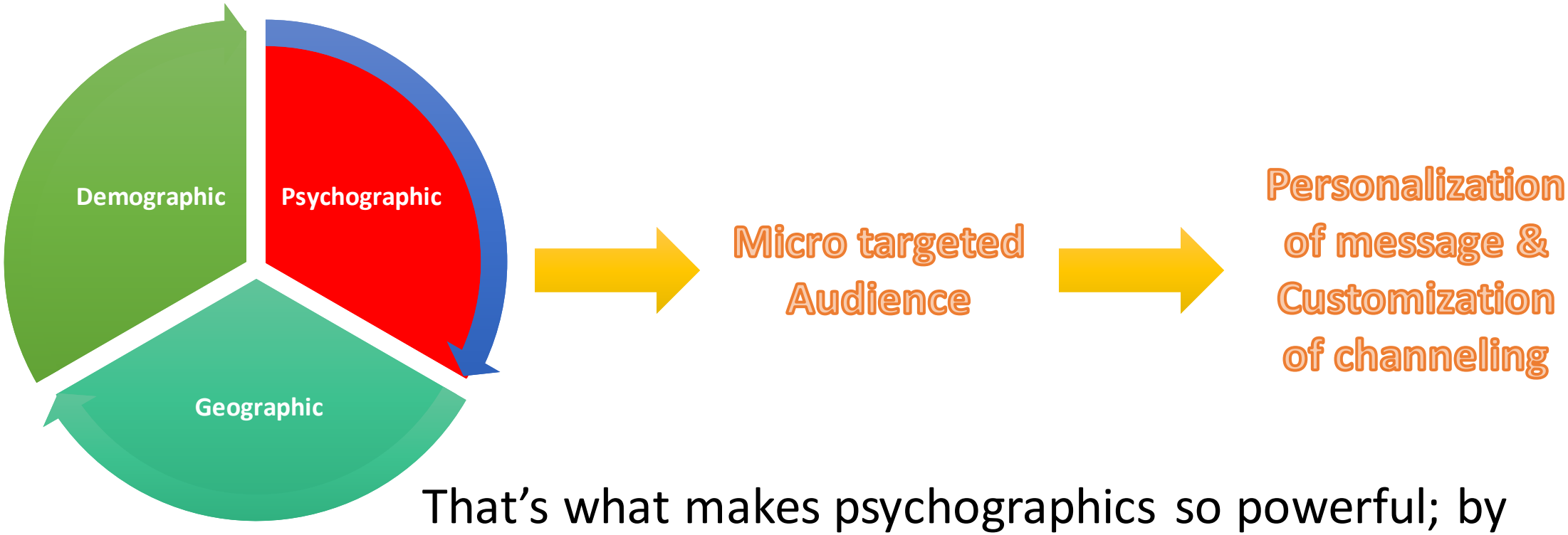
It is informative and normative way of communication

this is behavior communication and **more powerful** underlying **motivation**, that make people to think no matter what their age or race (demographics)..!!!


MARKET SEGMENTATION
DEMOGRAPHICS
Age
Gender
Income
Marital Status
Ethnic Background
GEOGRAPHICS
Local
Regional
National
International
PSYCHOGRAPHICS
Activities
Attitudes
Personality and Values
BEHAVIORAL
Benefits
Patterns
Usage Rates

Big Data

- Aggregation of many data points that you can possibly get hands on then sensitize, clean and inform of your target audience



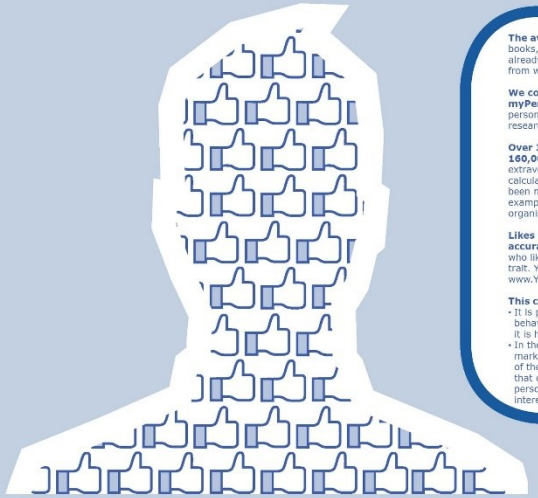
That's what makes psychographics so powerful; by combining demographic data with psychographic data, business can **build much more complete, sophisticated profiles** of consumers based on a much richer picture of who they really are.

The University of Nottingham

369 Like

You are what you Like

Clicking on the Like button says more about you than you might think...



The average Facebook user has over 200 Likes. They can be anything, from favourite books, movies, and celebrities, to politicians, slogans, and academic subjects. Gosling et al. (2007) already showed that someone's profile sheds light on their personality, but Likes are now available from websites even away from Facebook and are easy to click without deliberation.

We collected personality and Likes from over 170,000 Facebook users via the myPersonality app. All users answered a personality questionnaire, received extensive and personalised feedback on their personality results, and users could choose to opt-in to our research. The myPersonality app is still available from http://apps.facebook.com/mypersonality

Over 36,000,000 User-Like pairs were analysed in order to determine the personality of 160,000 Likes. Data were anonymised first, so we analysed connections such as "male; 36; extraversion score 2.5; likes Lady Gaga". The aggregate personality for each Like was then calculated by averaging the personalities of all of the individuals who liked it. These profiles have been made freely available to anyone through our new website www.LikeAudience.com. For example, the personality that likes Orwell's *Nineteen Eighty-Four* is extremely liberal, quite organised, very introverted, quite competitive, and relatively impervious to stress.

Likes were able to distinguish each of someone's five personality traits with over 75% accuracy. By merging the Likes that someone has with the aggregate personalities of the people who like it, it is possible to accurately predict whether someone is high or low in each personality trait. You can find out what your Likes say about you from our new website: www.YouAreWhatYouLike.com

This could revolutionize both personality questionnaires and marketing:

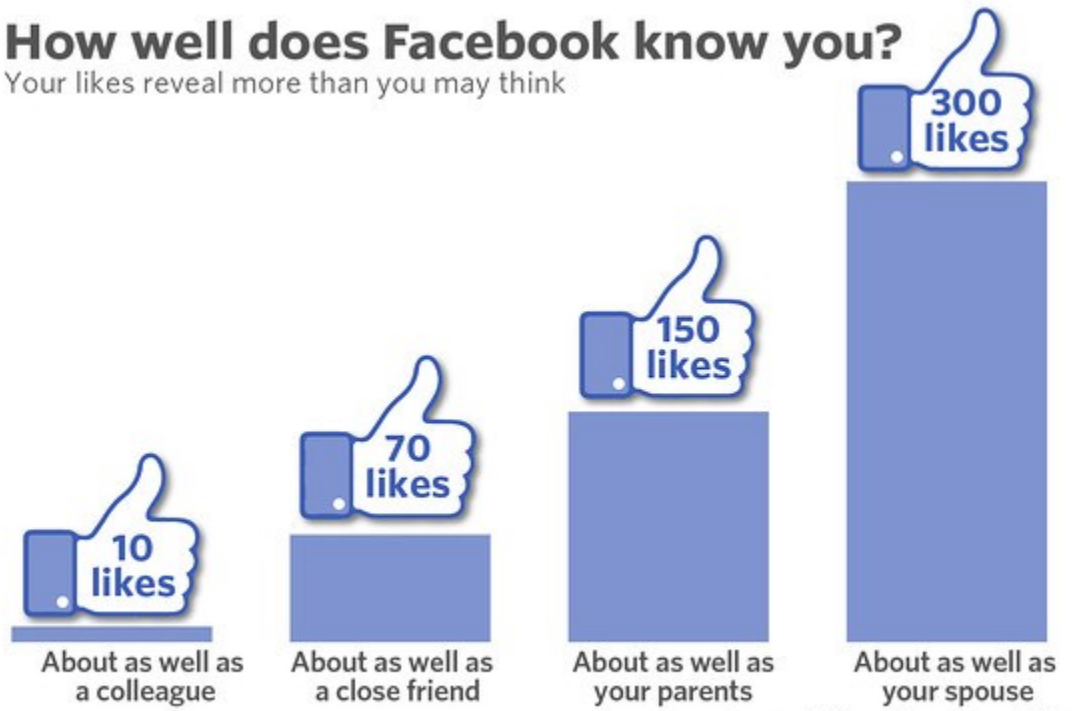
- It is possible to determine someone's personality without asking them any questions at all. This behavioural residue measurement is free from many of the biases in traditional questionnaires as it is harder to fake and is based on actual behaviour rather than reported behaviour.
- In the past, when marketers wanted to understand who likes a product, they had to give people a market research survey. These are expensive and boring, and it was impossible to ask about all of the hundreds of products available. However, LikeAudience.com gives data about a product that can be compared to all of the other 160,000 Likes available. It also brings scientific personality traits to marketers, so that they can accurately target the 'minds' who might be interested in their ads. This reduces spam by making advertising more relevant.

David Stillwell, Michal Kosinski & Dr Richard Tunney
From the University of Nottingham and the University of Cambridge
For more information email david@mypersonality.org

Find out what your Likes say about you at www.YouAreWhatYouLike.com

How well does Facebook know you?

Your likes reveal more than you may think



Source: University of Cambridge

Audience Segmentation

Big 5 Trait	Example Behavior for LOW Scorers	Example Behavior for HIGH Scorers
Openness	Prefers not to be exposed to alternative moral systems; narrow interests; inartistic; not analytical; down-to-earth	Enjoys seeing people with new types of haircuts and body piercing; curious; imaginative; untraditional
Conscientiousness	Prefers spur-of-the-moment action to planning; unreliable; hedonistic; careless; lax	Never late for a date; organized; hardworking; neat; persevering; punctual; self-disciplined
Extraversion	Preferring a quiet evening reading to a loud party; sober; aloof; unenthusiastic	Being the life of the party; active; optimistic; fun-loving; affectionate
Agreeableness	Quickly and confidently asserts own rights; irritable; manipulative; uncooperative; rude	Agrees with others about political opinions; good-natured; forgiving; gullible; helpful; forgiving
Neuroticism	Not getting irritated by small annoyances; calm, unemotional; hardy; secure; self-satisfied	Constantly worrying about little things; insecure; hypochondriacal; feeling inadequate

Do they enjoy new experiences?

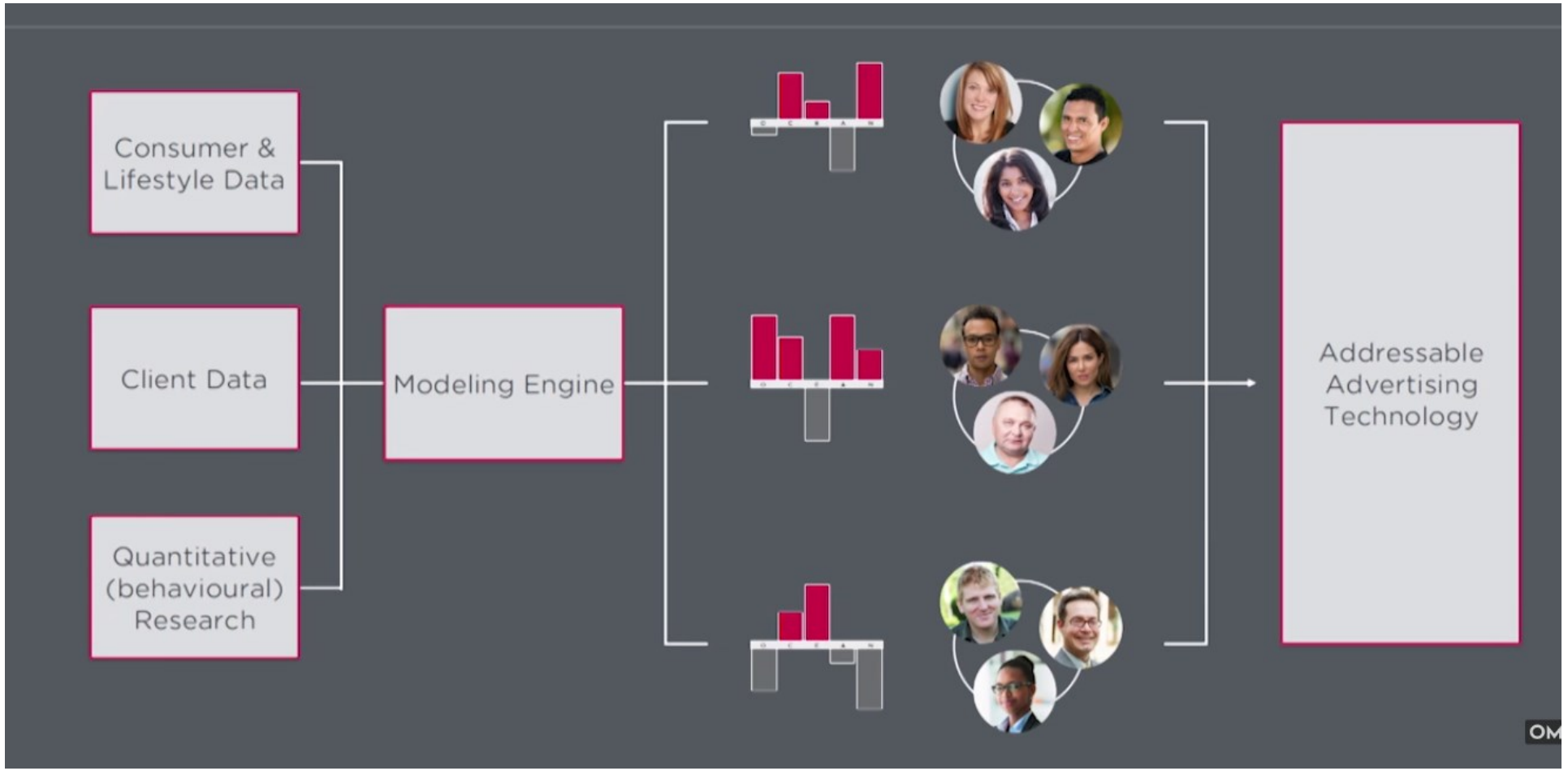
Do they prefer plans & order?

Do they like spending time with others?

Do they put people's need than theirs?

Do they tend to worry a lot?

Turning Big Data into Smart Data



Today, we can use big data to understand exactly what messages within each every group within the targeted audience

Can big data be avoided?

- Pay cash for everything!
- Never go online!
- Don’t use a telephone or mobile phone!
- Don’t use credit card!
- Don’t fill any prescriptions!
- Never leave your house!

Workforce Mapping of Fourth Industrial Revolution: Optimization to Identity

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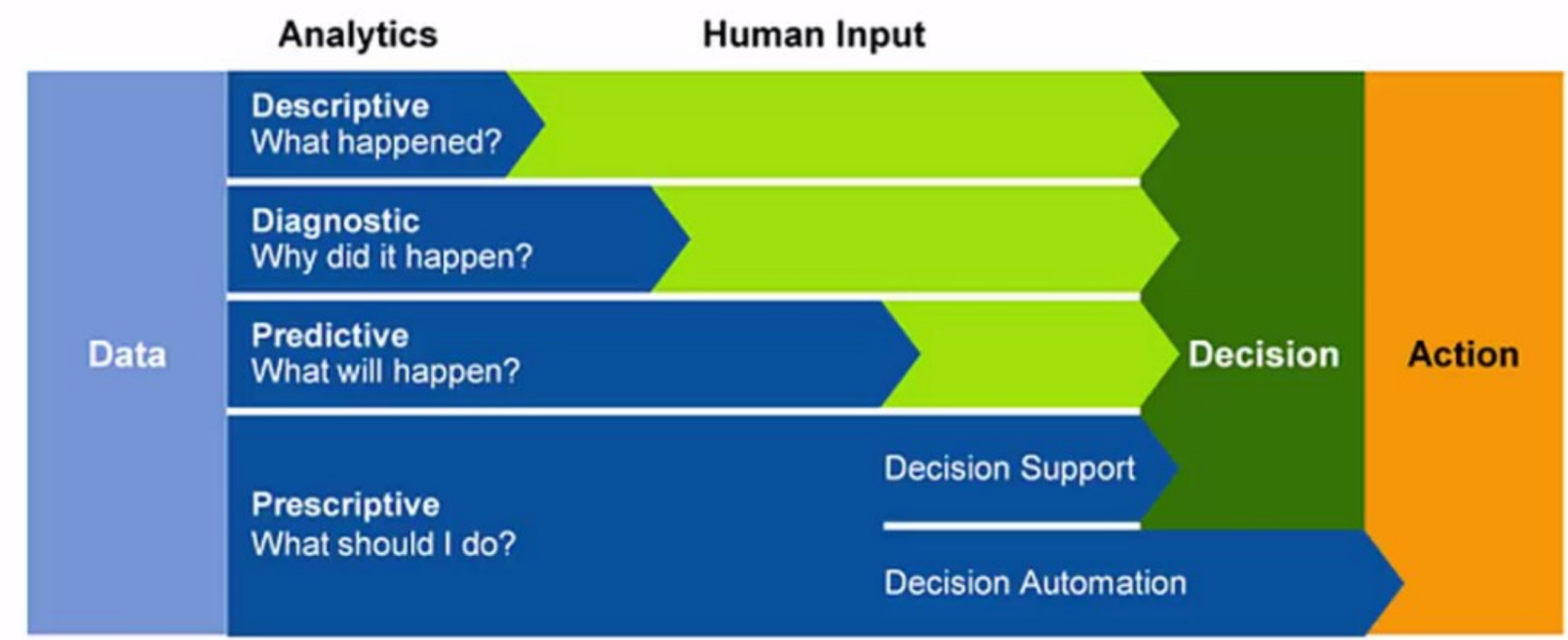
Abstract. The most challenging issue in Industry 4.0 is the reduction of the human workforce. This study proposes a mastery concept in identifying a job that can be replaced in Industry 4.0 by machine and a job that hardly replaced by machine. It explains in a job matrix format distinguishing types of jobs that need machine or technologies for optimization and jobs that require compassionately for maintaining an identity as a human being. The matrix defines the nature of a job into a routine human to human interaction, complex human to human interaction, human to machine interaction, and finally machine to machine interaction. The job matrix can become a tool for an organization to develop strategies in the Industry 4.0. The research was based on a qualitative method where secondary data gathered from the literature review analysis. The routine job and non-compassion task required will be replaced by machines and technologies. While, job nature with complexity in decision-making, creativity, innovation, and compassion will remain sustainable in the Industry 4.0.

Keywords: Industry 4.0; Job Matrix; Employment; Education 4.0 Optimization; Identity

Ethics & Industry 4.0



Source: Gartner (October 2014)

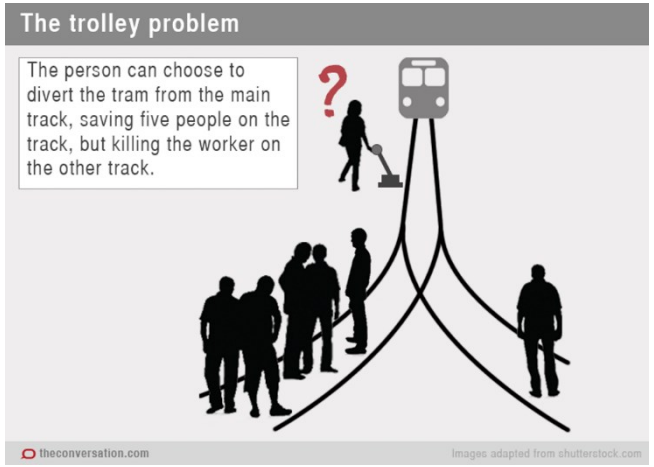
Ethical principle & Theories

- According to the Utilitarian principle; a decision is ethical if it provides **greater net utility (*greater better consequences)* than any other decision**.
  - **Best decision yields the greatest net benefits to society**
  - **Worst decision yields the greatest net harms to society**
- Meanwhile, the **Deontological** theory that the **morality of an action** should be based on whether that **action** itself is **right or wrong** under a series of rules, rather than based on the ***consequences*** of the action
  - – like killing an innocent person – are just wrong, even if they have good consequences.

Classic Train example

A runaway train is hurtling down the tracks towards 5 people who will be killed if it proceeds on its present course. You can save these 5 by diverting the train onto a different set of tracks, one that has only 1 person on it, but if you do this that person will be killed.

- *Do nothing, and the train kills the five people on the main track or*
- *Pull the lever, diverting the trolley onto the side track where it will kill one person.*
- *Which is the* ***most ethical choice****?"*



developed by philosopher Philippa Foot in 1967 and adapted by Judith Jarvis Thomson in 1985.

Fallacies in Ethical Decision Approach

- Philosophers who come up with these **artificial scenarios** with **artificial restrictions** proceed from a flawed assumption: that morality, ethics, and values are statics and exists as an independent much like a **mathematical equation** **or** **quantitative approach**.
- In reality, value, ethics and morality is dynamic and human construct (human centric/human-to-human interaction) created to allow us to live with each other. It does provide an answer to every possible moral dilemmas in an attempt to find **win-win solution** (aligned with *Syariah* principle).
- Of course, in any case that we simply do not know (not sure) what the right course of action is. Then, the only thing we can do is make a choice (according to Syariah compliance) and live with the **consequences** of that choice as **Divine Preordainment and Divine Decrees (Qadhaa' and Qadr)**.
- Choosing to do nothing is also a choice.

Sample Ethical challenges 4IR – Self Driving Car (Autonomous Vehicle)

Should a self-driving car protect the life of its passengers, even at the expense of a greater number of pedestrians? Or car should protect us at all costs or other pedestrians?

Ethical Challenges

- **Responsible 4IR ensures attention to ethical, values, and moral principles to ensure that fundamental human ethics (identities) are not compromised.**
- Challenge of spreading ***hoax and false information*** not only among society but also among "things" (machines) → wrong decision → fatalities
- Privacy, security, and ***data protection awareness*** in Individual and national level
- The absence of ethical standard for assessing associated technologies i.e. If mistakes are made which cause harm, who should bear the risk?
- Bias: Machine learning systems can entrench existing bias in decision-making systems → ensure that AI evolves to be non-discriminatory (not programed to be discriminatory)
- Social interactions challenges due to adoption of technologies must ***preserve Identity.***

- The first hard disk drive came from IBM. It was called the IBM Model 350 Disk File and was a huge device. It had **50 24-inch disks** contained inside a cabinet that was as large as a cupboard and anything but lightweight. This hulk of a storage unit could store a whopping 5 MB of data.

- It took 51 years before hard disk drives reached the size of 1 TB (terabyte, i.e. 1,000 GB). This happened in 2007. In 2009, the first hard drive with 2 TB of storage arrived. So while it took 51 years to reach the first terabyte, it took just *two* years to reach the second.

Concluding remark

- **4IR can only optimize not create.** We may invest in hard sciences (science & technology) for optimization. However, we must not forget the main problem in 4IR is not merely the loss of jobs, **what's more serious than the loss of jobs is the loss of meaning/identity.** Overcoming the identity and moral crisis of the impact of technology requires **preserving identity and morality** that requires high expertise in Education, Islamic Knowledge, Social Science, and humanities.

Thank You