

**M U N I
E C O N**

D8 - Cellulographics[©]: A novel smartphone user classification metrics

Prateek Kalia

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FEEDBACK

In news

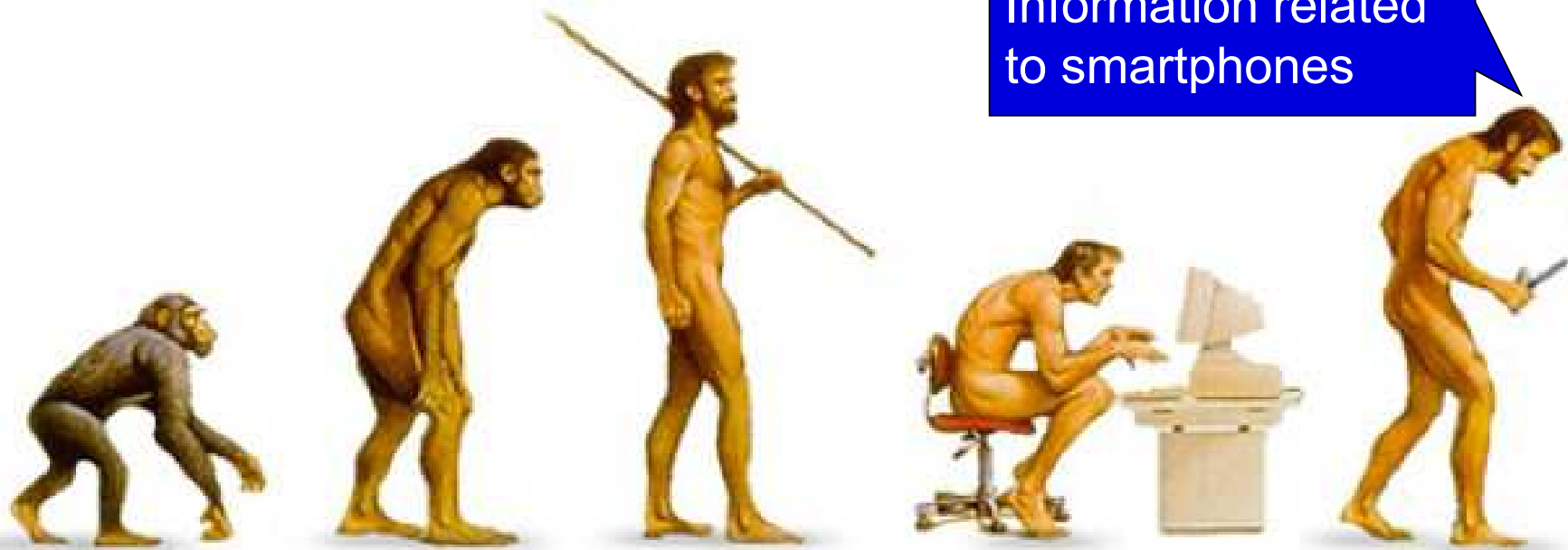
- <https://www.econ.muni.cz/en/news/cellulographics-is-a-great-new-tool-to-measure-smartphone-use>

Minute-to-minute program

- | | |
|---|-------------|
| – Basic introduction (10 mins) | 9.00-9.10 |
| – Theoretical elaboration (60 mins) | 9.10-10.10 |
| – Instruction for practical task (20 mins) | 10.10-10.30 |
| – Break (30 mins) | 10.30-11.00 |
| – Creating conceptual models (60 mins) | 11.00-12.00 |
| – Presentation of conceptual models (60 mins) | 12.00-13.00 |

When did you meet a person without a smartphone recently?

Let us start with some statistical Information related to smartphones

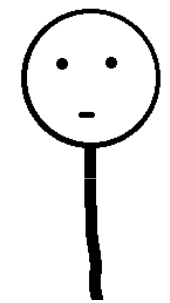
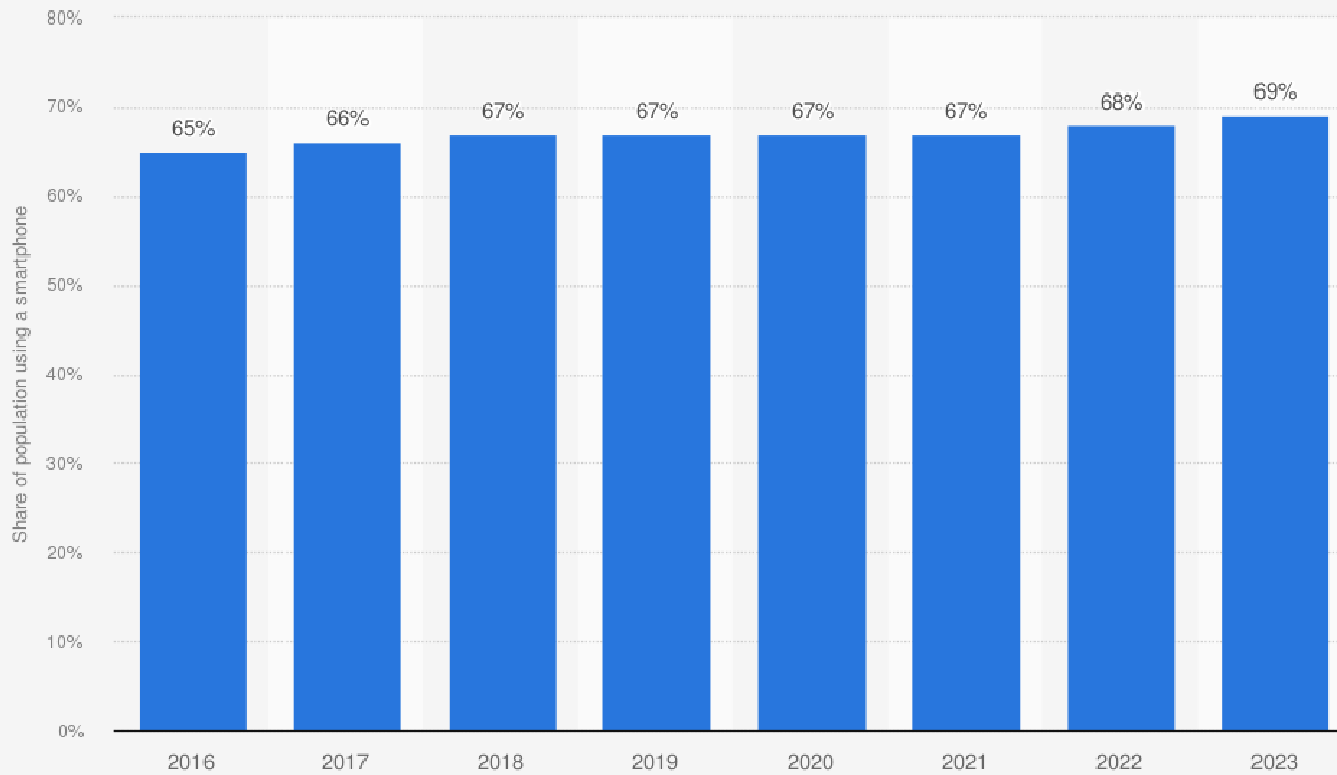


Global population



7.4 billion

Global smartphone penetration rate as share of population from 2016 to 2023



Source
GSMA
© Statista 2024

Additional Information:
Worldwide; 2016 to 2022

BRICS

Brazil ✓

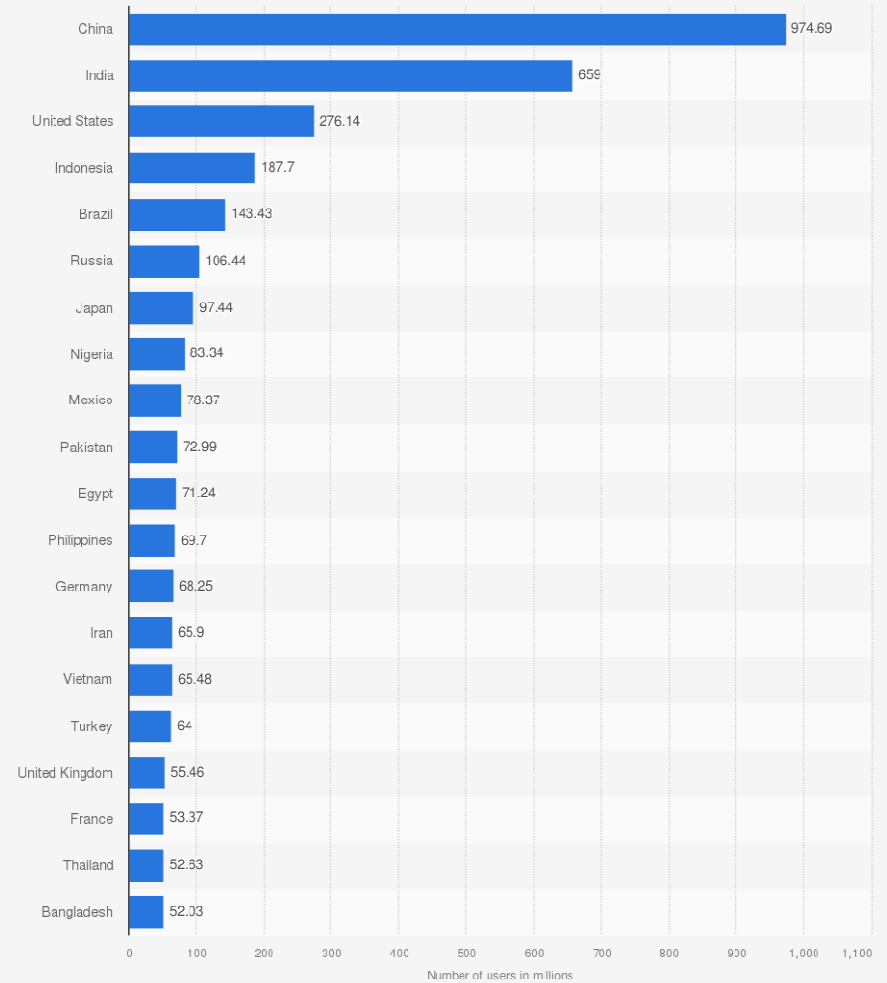
Russia ✓

India ✓

China ✓

South Africa ✗

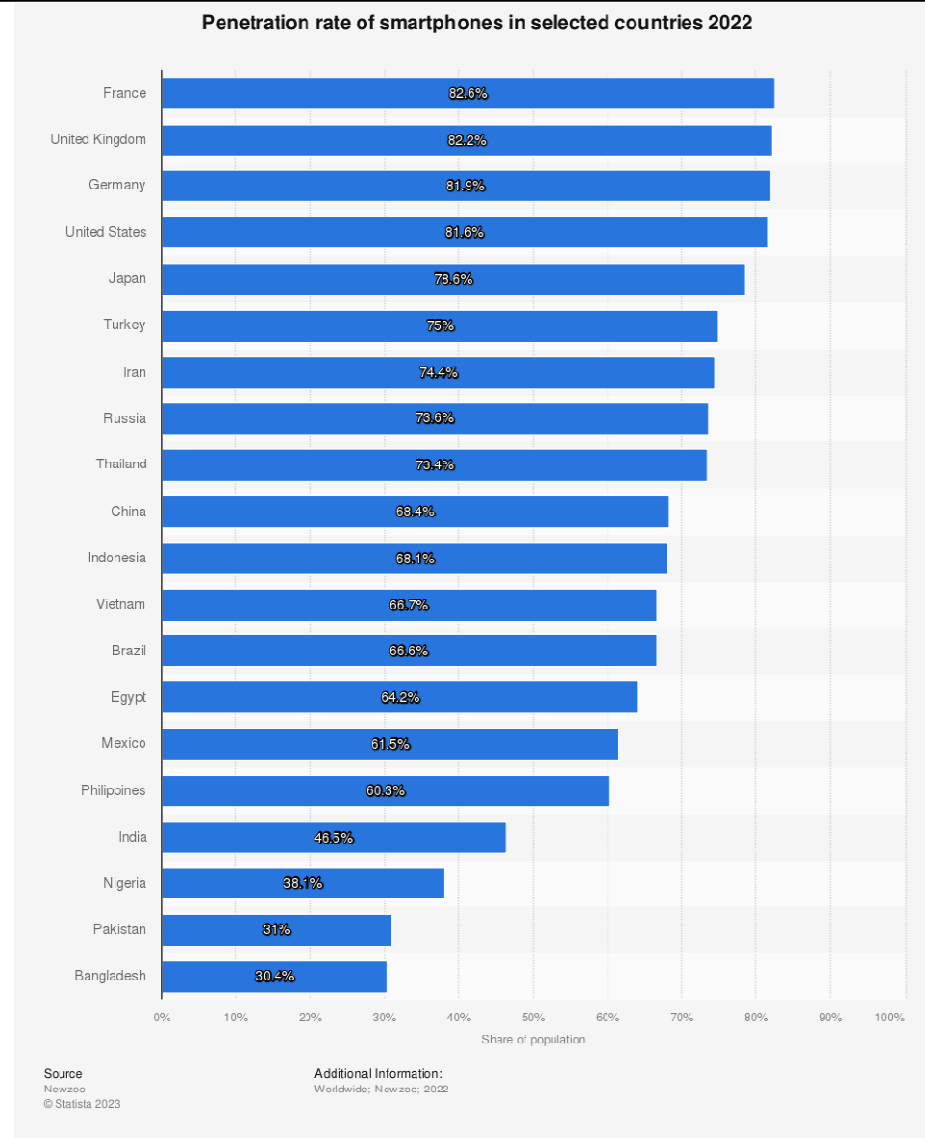
Number of smartphone users by leading countries in 2022 (in millions)



Source
Newzoo
© Statista 2023

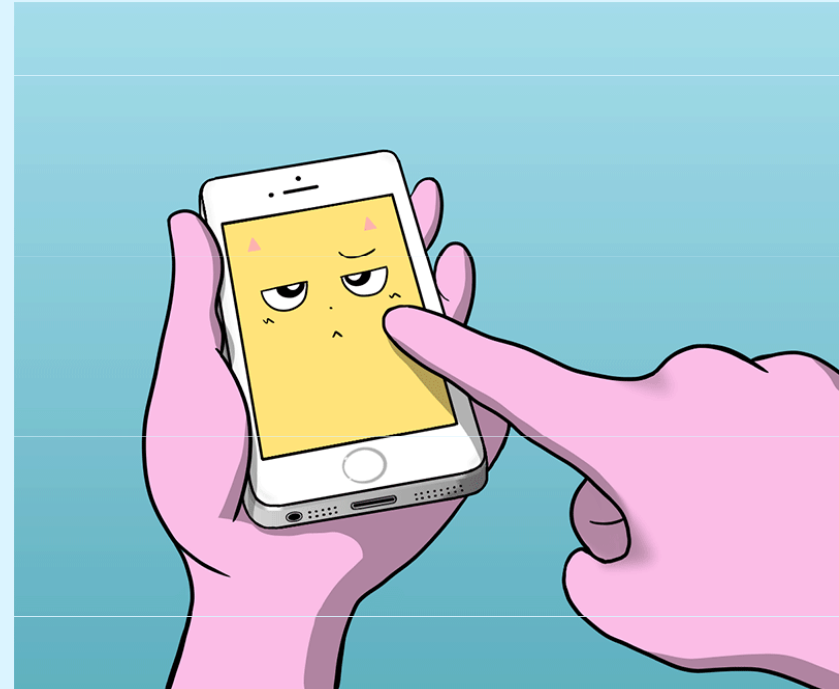
Additional Information:
Worldwide, 2022

Do you notice BRICS here?

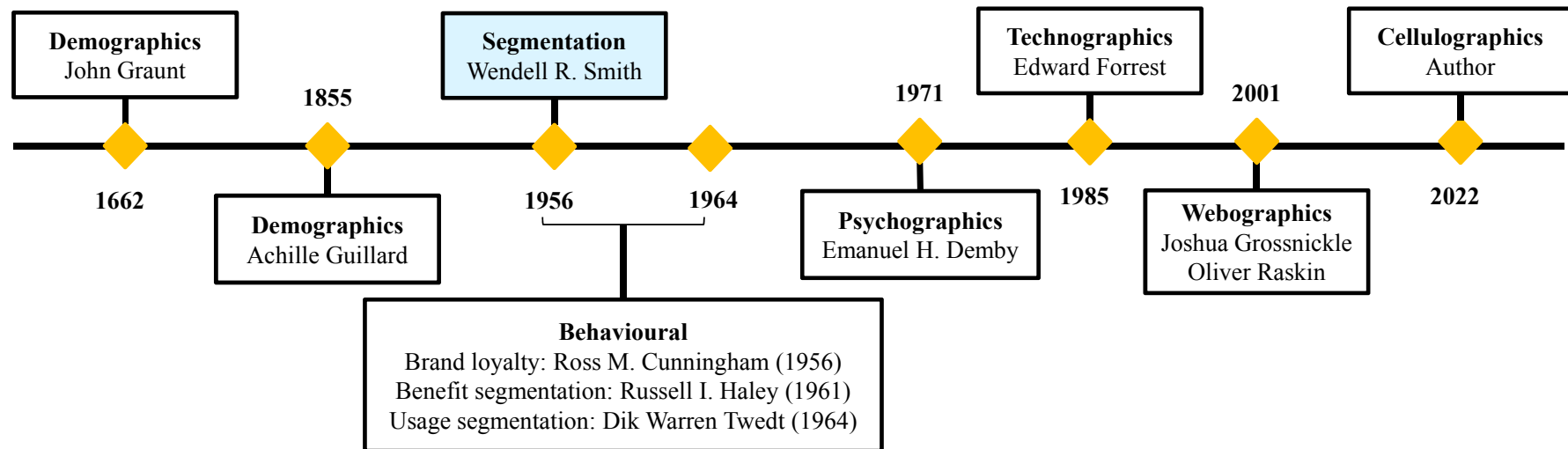


Agenda. Understanding Cellulographics[©]

- Major seminal works on segmentation/classification.
- Cellulographics[©] conceptual model
- Creating a research model incorporating cellulographics

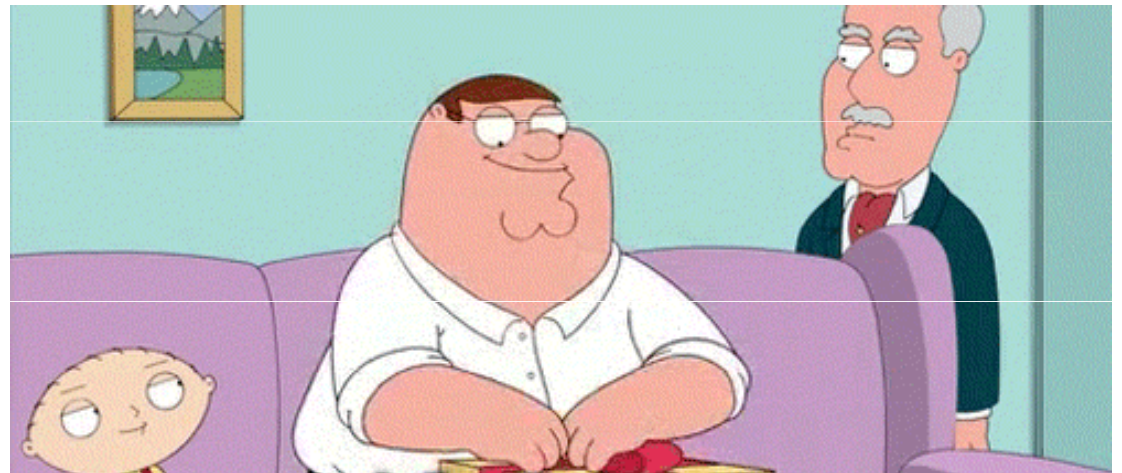


Major seminal works on segmentation/classification.



Geographic

- **Region** Pacific, Mountain, West North Central...
- **City or metro size** Under 4,999; 5,000–19,999; 20,000–49,999..
- **Density** Urban, suburban, rural
- **Climate** Northern, southern



John Graunt (1620-1674): The Father of Demography



CAPTAIN JOHN GRAUNT

Natural and Political Observations Upon the Bills of Mortality, 1662

The Diseases and Casualties this Week,

		Imposthume	1
		Infants	7
		Kingsevell	1
		Mouldfallen	1
		Kild accidentally with a Carbine, at St. Michael Woodstreet	1
		Overlaid	1
		Rickets	9
		Rising of the Lights	1
		Rupture	2
		Scalded in a Brewers Mash, at St. Giles Cripplegate	1
		Scurvy	4
		Spotted Feaver	2
		Stilborn	13
		Stopping of the Stomach	11
		Suddenly	1
		Surfeit	7
		Teeth	27
		Tifick	13
		Ulcer	1
		Vomiting	1
		Winde	1
		Wormes	1

A Bortive	7		
Aged	32		
Bleeding	1		
Childbed	5		
Chrisoms	9		
Collick	1		
Consumption	65		
Convulsion	41		
Cough	5		
Dropsie	43		
Drowned at S Kathar. Tower	1		
Feaver	47		
Flox and Small-pox	15		
Flux	3		
Found dead in the Street at Stepney	1		
Griping in the Guts	15		

Christned	Males — 121	Buried	Males — 195	} Plague 0
	Females — 111		Females — 198	
	In all — 232		In all — 393	

Decreased in the Burials this Week — 69

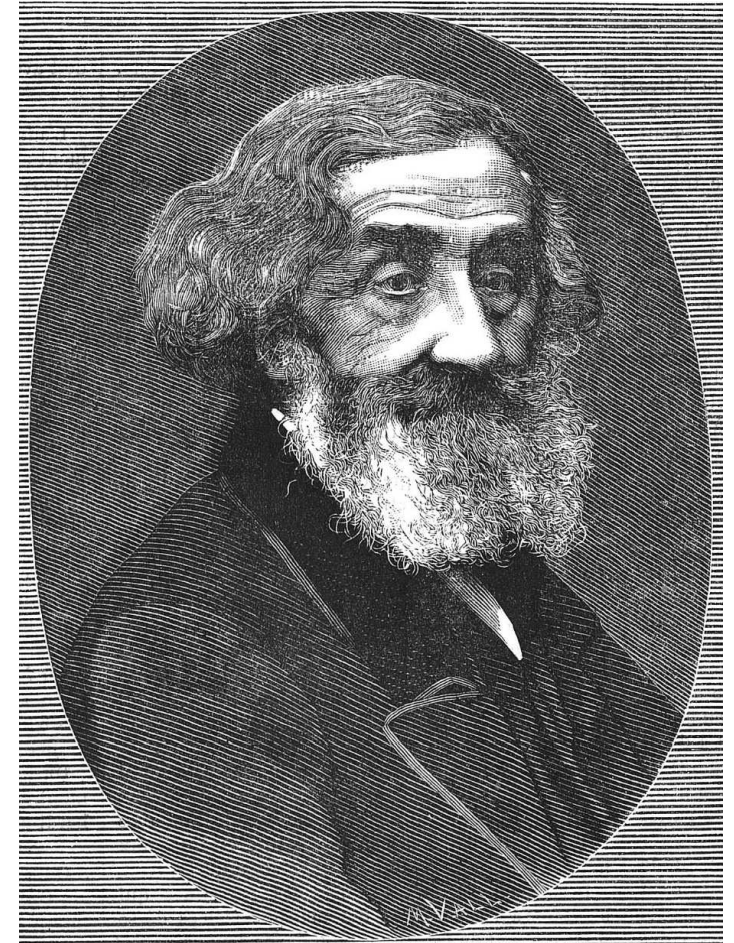
Parishes clear of the Plague — 130 Parishes Infected — 0

*The Assize of Bread set forth by Order of the Lord Mayor and Courts of Aldermen,
A penny Wheaten Loaf to contain Eleven Ounces, and three
half-penny White Loaves the like weight.*

Source: Wynder, E. L. (1975). John Graunt 1620-1674 The Father of Demography. Preventive Medicine, 4(1), 85-88.

Achille Guillard (1799-1876)

In 1855, a Belgian scholar Achille Guillard defined **demography** as the natural and social history of human species or the mathematical knowledge of populations, of their general changes, and of their physical, civil, intellectual, and moral condition.



Wendell R. Smith

Smith, W. R. (1956). Product Differentiation and **Market Segmentation** as Alternative Marketing Strategies. *Journal of Marketing*, 21(1), 3–8.



Demographic

- **Age** Under 6, 6–11, 12–19, 20–34, 35–49, 50–64, 65
- **Family Size** 1–2, 3–4, 5
- **Family life cycle** Young, single; young, married, no children..
- **Gender** Male, female
- **Income** Under \$9,999; \$10,000–\$14,999; \$15,000–\$19,999..
- **Occupation** farmers; retired; students; homemakers; unemployed
- **Education** high school graduate; some college; college graduate
- **Religion** Catholic, Protestant, Jewish, Muslim, Hindu, other
- **Race** White, Black, Asian, Hispanic

Demographic (Contd..)

- **Generation** Generation X (1965-1980), Y (1981-1996), Z (1997-2012)
- **Nationality** British, French, German, Italian, Japanese
- **Social class** Lower, working, middle, upper

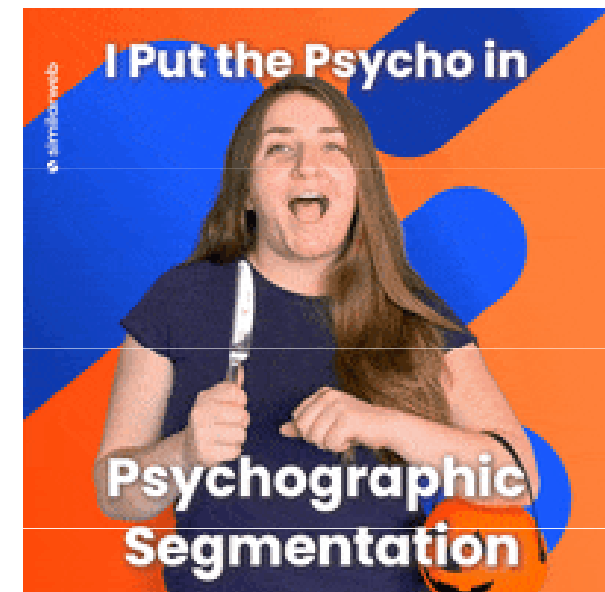
Psychographic

- **Lifestyle** Straights (mainstream), swingers (open communication and relationship), longhairs (hippie, experimental)
- **Personality** Compulsive (perfectionist), gregarious (social), authoritarian (hierarchy and leadership), ambitious (success and achievement)
- **Values** (deeply held beliefs) **and attitude** (evaluative statements or judgments)

Psychographic: Seminal works

Demby, E. H. (1971). **Psychographics**: Who, What, Why, When, Where and How. In C. W. King & D. Tigert (Eds.), *Attitude Research Reaches New Heights*, Proceedings of the Attitude Research Conference.

Arnold Mitchell (February 18, 1918 – July 17, 1985) was a social scientist and consumer futurist who worked for SRI International and created a noted psychographic methodology, **Values, Attitudes and Lifestyles** (VALS).



Behavioral

- **Occasions** Regular occasion, special occasion
- **Benefits** Quality, service, economy, speed
- **User status** Nonuser, ex-user, potential user, first-time user, regular user
- **Usage rate** Light user, medium user, heavy user
- **Loyalty status** None, medium, strong, absolute
- **Readiness stage** Unaware, aware, informed, interested, desirous, intending to buy
- **Attitude toward product** Enthusiastic, positive, indifferent, negative, hostile

Behavioural: Seminal works

Cunningham, R. M. (1956). **Brand loyalty**, what, where, how much? Harvard Business Review, 34(1), 116–128.

Haley, R. I. (1968). **Benefit Segmentation**: A Decision-oriented Research Tool. Journal of Marketing, 32(3), 30–35.



Twedt, D. W. (1964). How Important to Marketing Strategy Is the "**Heavy User**"? Journal of Marketing, 28(1), 71–72.



Other segmentations

Webographics: Joshua Grossnickle and Oliver Raskin



Grossnickle, J., & Raskin, O. (2001). Handbook of Online Marketing Research. New York: McGraw-Hill.



Technographics:
Edward Forrest

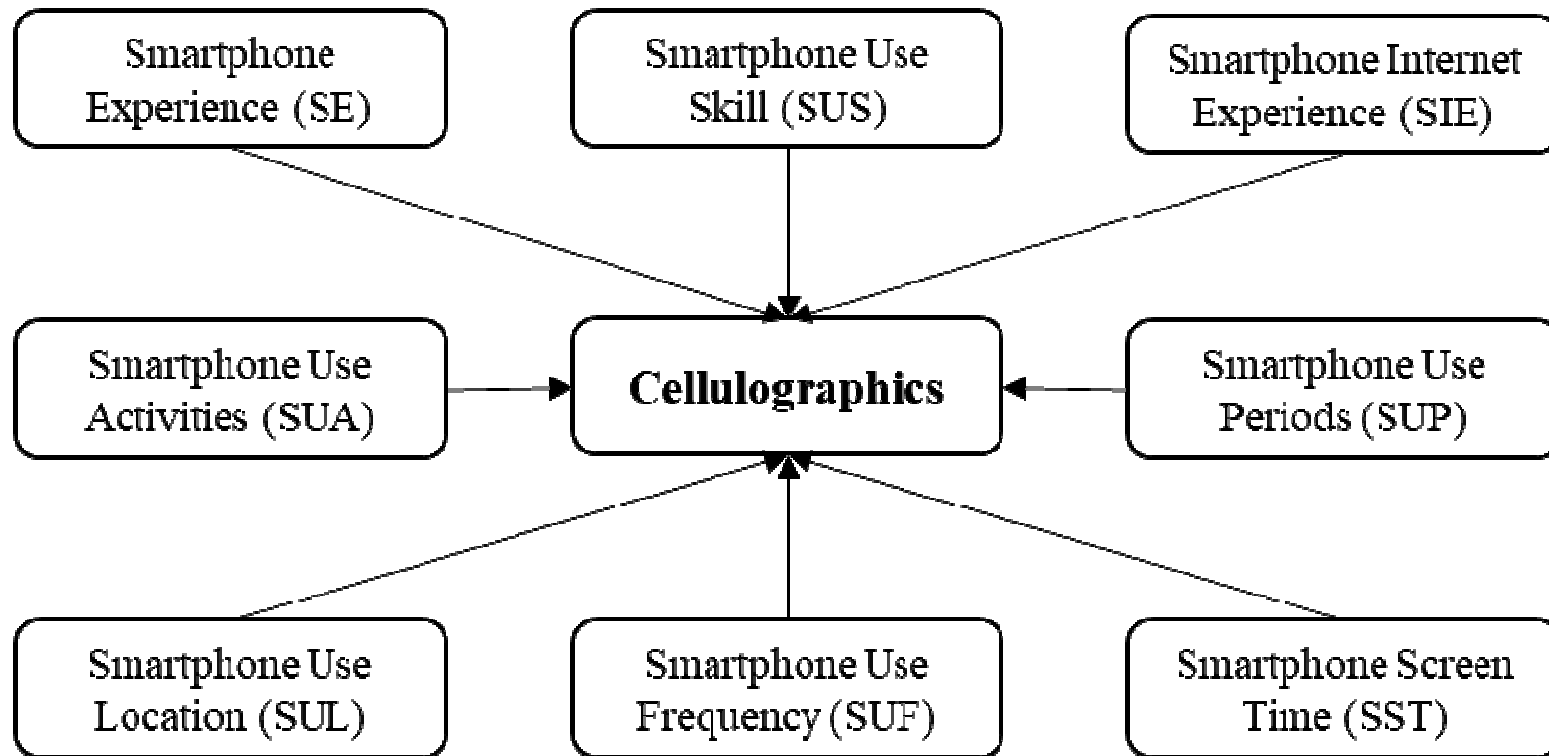
Cellulographics: The new metrics

- The **traditional segmentations** are getting **dated** because consumers are migrating to smartphones for their daily online activities. Smartphones are versatile, portable, and 24/7 accessible. Worldwide, **smartphone subscription** is expected to grow to **7216 million users by 2026** (Statista, 2021), but there is **no classification metrics based on smartphone use to date**. To fill this gap ‘Cellulographics’ has been proposed and defined as below.

Definition

- Cellulographics is a term developed for **behavioral classification** of **smartphone users** based on smartphone experience (SE), smartphone use skill (SUS), smartphone internet experience (SIE), smartphone use periods (SUP), smartphone screen time (SST), smartphone use frequency (SUF), smartphone use activities (SUA), and smartphone use location (SUL). These terms are explained below.

Cellulographics[©] conceptual model



Smartphone experience (SE)

- It is the **number of years** an individual is using a smartphone. This criterion is important because the length of usage, familiarity, compatibility of the innovation with past experiences, existing values, needs, expertise, background, and prior knowledge can inhibit or motivate technology use.

Smartphone use skill (SUS)

- It is an **individual's self-assessment** of the **ability** and **proficiency** to **use** the smartphone. Due to differences in culture, social environment, personal characteristics, technological context, etc., information communication and technology (ICT) skills may vary in individuals.

Smartphone internet experience (SIE)

- It is an **individual's internet experience through a smartphone**. Marketers are trying to provide a seamless mobile internet experience to the users (Asunmaa et al., 2002). Advantages like, mobility, lightweight, long battery life, instant-on capability, high-definition touch screen, and interactivity are leading to higher smartphone dependency and gratifications.

Smartphone use periods (SUP)

- It is the **time when the user indulges in smartphone use in a day**, like morning (6:01 to 12:00), afternoon (12:01 to 18:00), evening (18:01 to 0:00), and night (01:00 to 6:00) (MAEN). Researchers believe that differences may exist in total daily duration, number of uses, and use length at different times of the day.

Smartphone screen time (SST)

- It is the **time measured in the number of hours or minutes per day, spent by an individual on smartphone use**. Researchers believe that screen time is one of the effective methods for determining technology usage.

Smartphone use frequency (SUF)

- It is the **number of use sessions in a specific time period** or the **number of times an individual checks his or her smartphone**. SUF is also one of the important criteria to access technology usage.

Smartphone use location (SUL)

- It is the **location from where an individual uses the smartphone** or access the internet through it, such as home, office, leisure place, etc. Locational categories (shopping, movie and shows, work and education, recreation and amusement, food and drink, and sports and exercise) proposed by Exler et al. (2016) are quite balanced.

Smartphone use activities (SUA)

- A smartphone is a versatile device, it can be used for a variety of work or leisure activities. Elhai et al. (2016) proposed an extensive list that includes 11 activities which are, voice/video calls, email, texting/instant messaging, internet/websites, social networking sites, games, music/podcasts/radio, watching video/tv/movies, taking pictures or videos, maps/navigation and reading books/magazines.

Future

- This concept can be applied to any field of study without limitations, where smartphone use is involved. For example, **medicine** (sleep and health issues due to smartphone use), **psychology** (smartphone addiction), **business management** (mobile commerce), **computers** (human-computer interactions), etc.

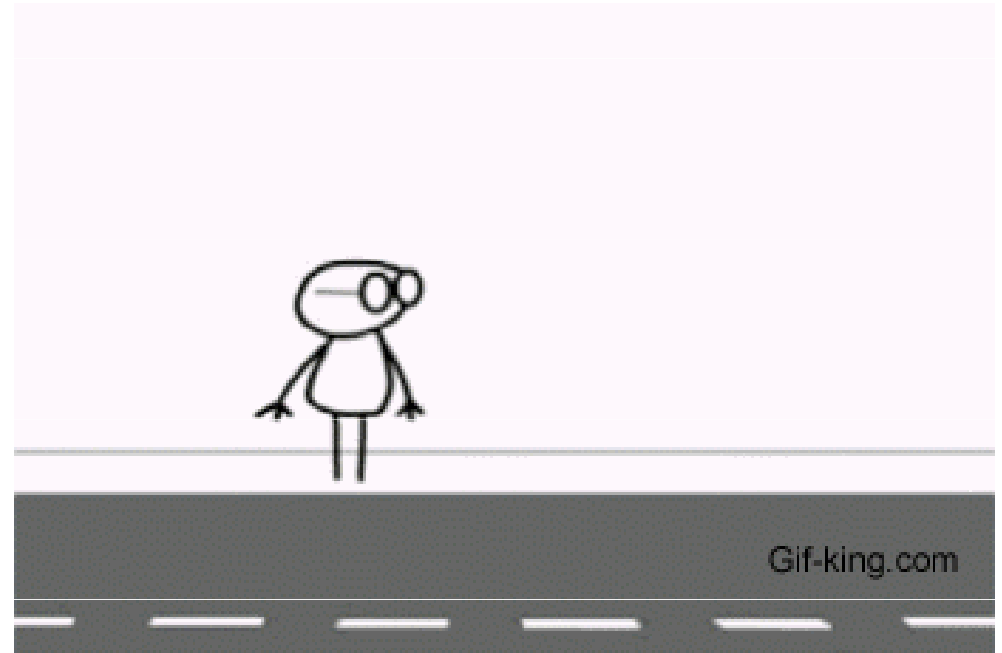


Any questions?



Some real practice now !

- **Task**
- To create a research model incorporating cellulographics and your field of interest.
 - Be original and creative, don't copy.



M A S A R Y K

U N I V E R S I T Y