Cellulographics© and Augmented Reality
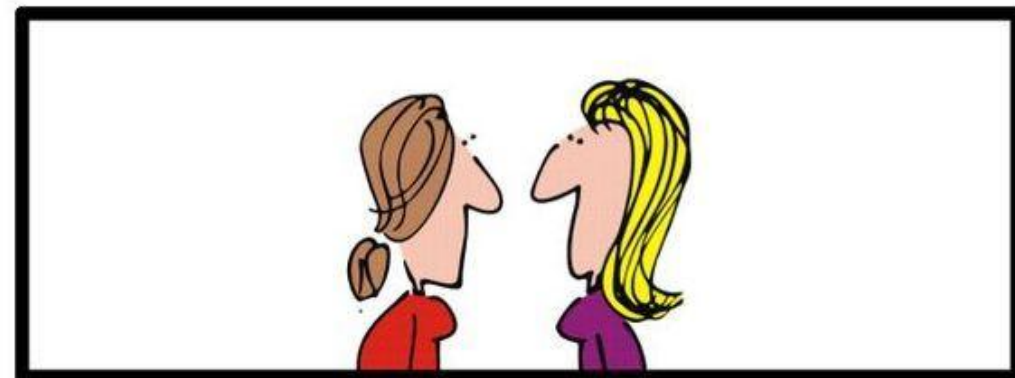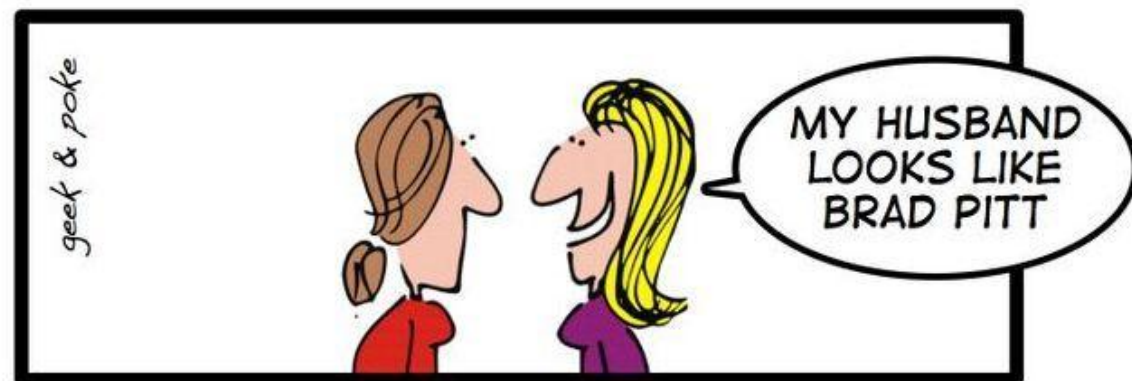
Prateek Kalia

Remarks

This concept is based on **Copyright No. L-68022/2017** (Copyright Division, Department of Industrial Policy & Promotion, Ministry of Commerce and Industry, India).

Kalia, P., Dwivedi, Y. K., & Acevedo-Duque, Á. (2022). Cellulographics©: A novel smartphone user classification metrics. Journal of Innovation & Knowledge, 7(2), 100179. https://doi.org/https://doi.org/10.1016/j.jik.2022.100179

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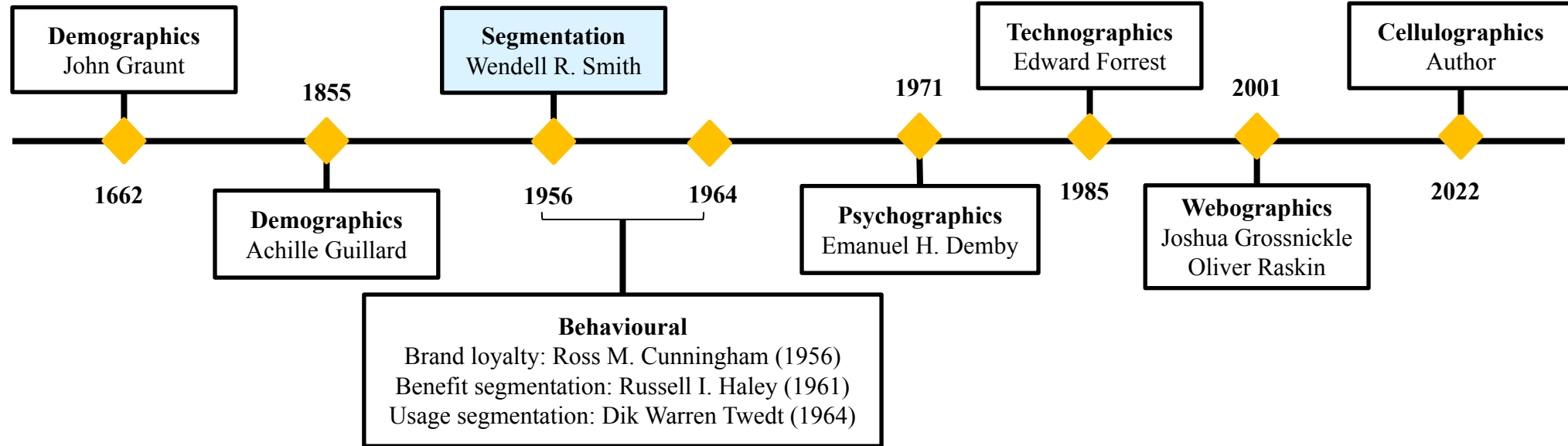ECON

Agenda

— Introduction to Cellulographics©

  — Major seminal works on segmentation/classification
  — Cellulographics: The new metrics
  — Future/Possible projects

— Cellulographics© and augmented reality

  — Augmented reality
  — Smartphone apps and augmented reality

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Major seminal works on segmentation/classification.

Demographics
John Graunt

Segmentation
Wendell R. Smith

Technographics
Edward Forrest

Cellulographics
Author

1855

1971

2001

1662

1956   1964

1985

2022

Demographics
Achille Guillard

Psychographics
Emanuel H. Demby

Webographics
Joshua Grossnickle
Oliver Raskin

Behavioural
Brand loyalty: Ross M. Cunningham (1956)
Benefit segmentation: Russell I. Haley (1961)
Usage segmentation: Dik Warren Twedt (1964)

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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

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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, 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

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Demographic (Contd..)

- Generation Baby boomers, Generation Xers
- Nationality British, French, German, Italian, Japanese
- Social class Lower, working, middle, upper

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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

Buyer persona development / Department of Corporate Economy

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Psychographic

- Lifestyle Straights, swingers, longhairs

- Personality Compulsive, gregarious, authoritarian, ambitious

- Values (codified principles based on morals) and attitude (standpoints, predispositions)

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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.

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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.

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Cellulographics© conceptual model

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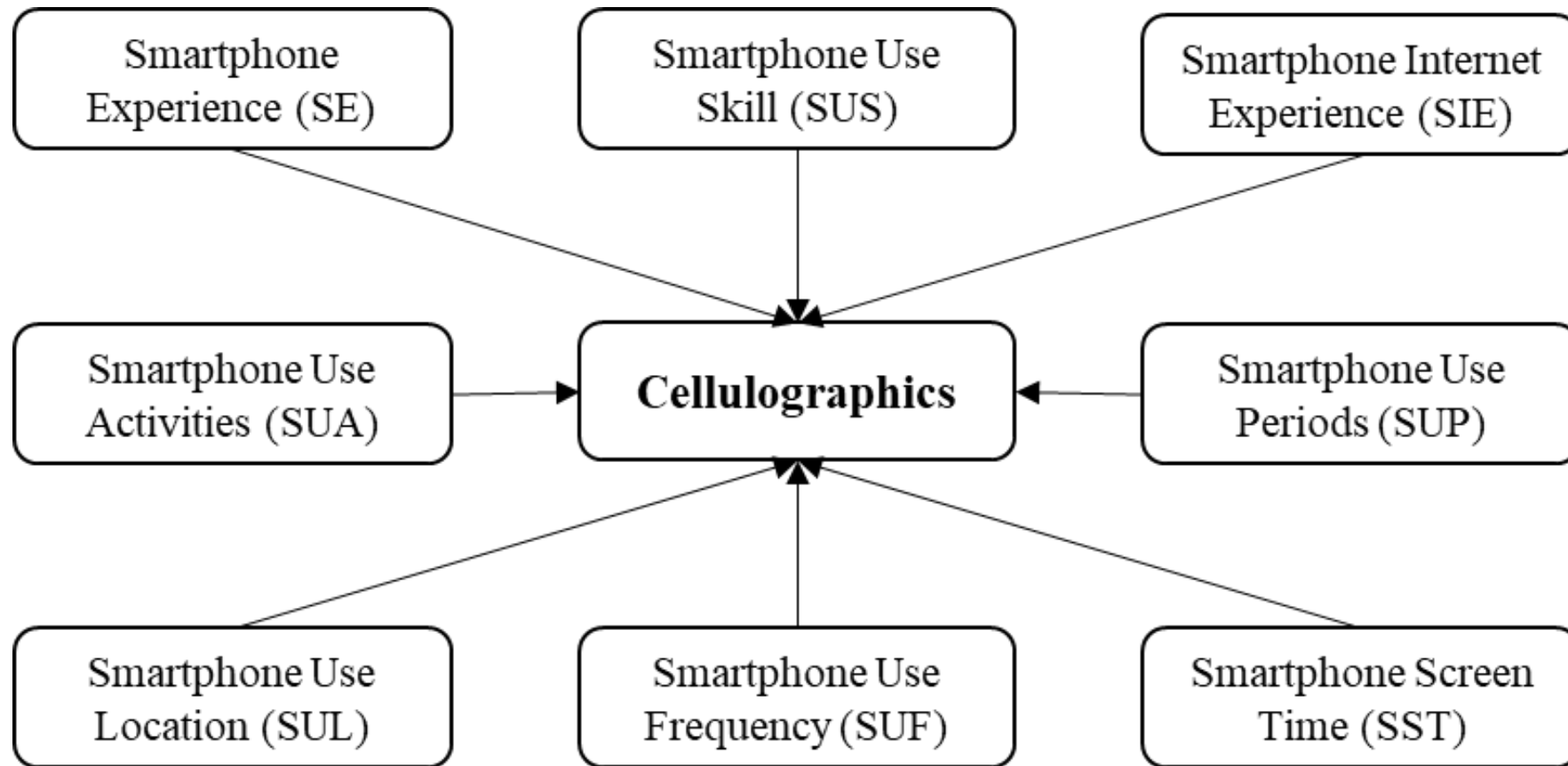
Smartphone experience (SE)

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.

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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.

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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.

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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.

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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.

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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.

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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.

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Smartphone use activities (SUA)

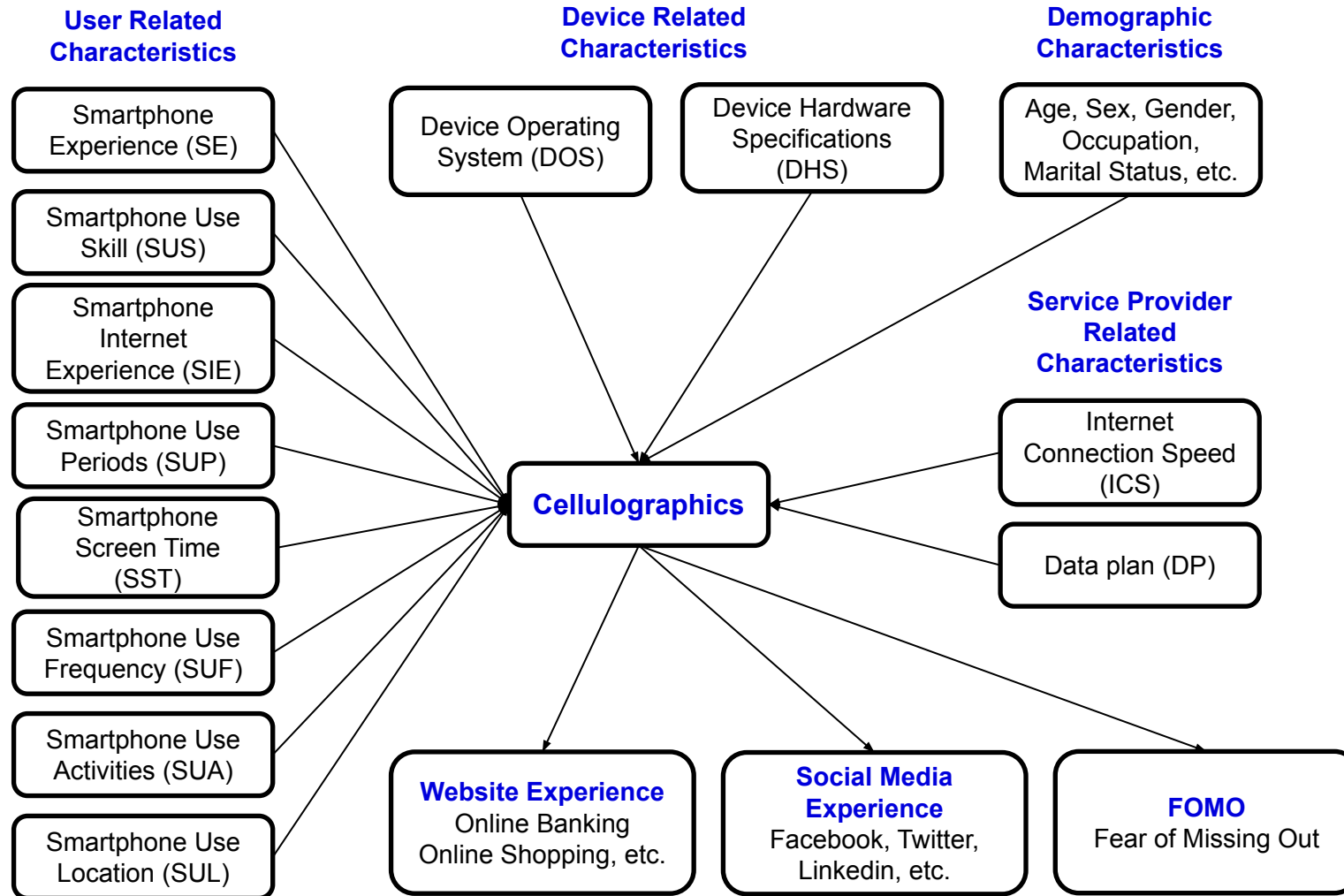A smartphone is a versatile device, it can be used for a variety of work or leisure activities. Elhai et al. (2016) proposed an extensive list that includes 11 activities which are, voice/video calls, email, texting/instant messaging, internet/websites, social networking sites, games, music/podcasts/radio,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

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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.

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Possible Project

User Related Characteristics
- 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)
- Smartphone Use Location (SUL)

Device Related Characteristics
- Device Operating System (DOS)
- Device Hardware Specifications (DHS)

Demographic Characteristics
- Age, Sex, Gender, Occupation, Marital Status, etc.

Service Provider Related Characteristics
- Internet Connection Speed (ICS)
- Data plan (DP)

Cellulographics

Website Experience
Online Banking
Online Shopping, etc.

Social Media Experience
Facebook, Twitter, Linkedin, etc.

FOMO
Fear of Missing Out

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Augmented reality (AR)

Augmented reality (AR) is an interactive experience that combines the real world and computer-generated content.

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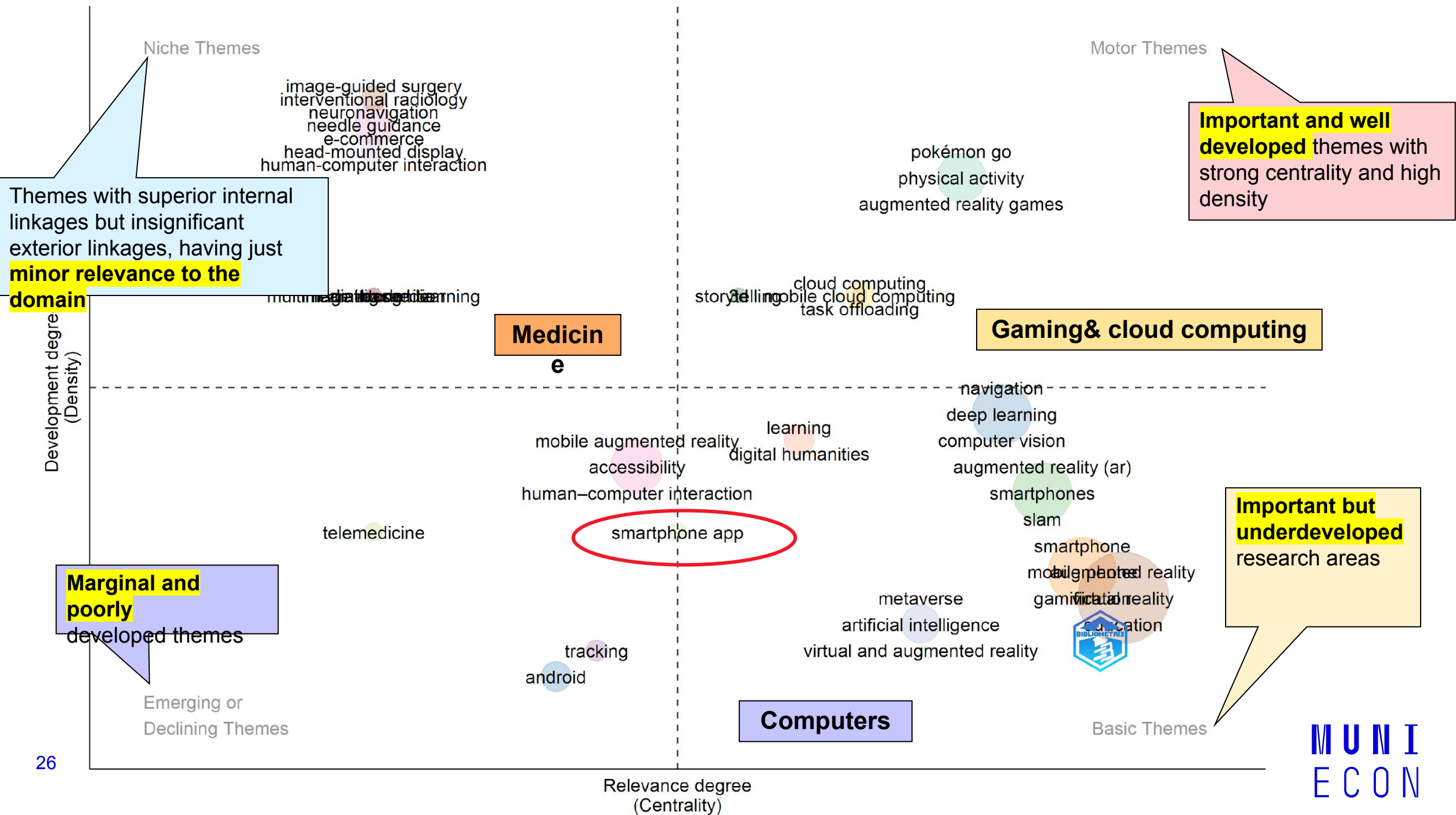ECON

Cellulographics© and Augmented Reality

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Augmented reality and smartphones: A thematic analysis

Searched Scopus database for:

- Article titles, abstract, keywords: Augmented reality AND (smartphone OR "mobile phone")
- Articles only
- English language only
- 947 articles

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Niche Themes

image-guided surgery
interventional radiology
neuronavigation
needle guidance
e-commerce
head-mounted display
human-computer interaction

Themes with superior internal linkages but insignificant exterior linkages, having just **minor relevance to the domain**

Motor Themes

Important and well developed themes with strong centrality and high density

pokémon go
physical activity
augmented reality games

multimedia deep learning

cloud computing
storytelling mobile cloud computing
task offloading

Medicine

Gaming& cloud computing

Development degree (Density)

navigation
deep learning
computer vision
augmented reality (ar)
smartphones
slam

learning
mobile augmented reality
digital humanities
accessibility
human–computer interaction

smartphone app

Important but underdeveloped research areas

telemedicine

smartphone
mobile phones augmented reality
gamification virtual reality
education

Marginal and poorly developed themes

metaverse
artificial intelligence
virtual and augmented reality

BIBLIOMETRIX

tracking
android

Computers

Emerging or Declining Themes

Basic Themes

Relevance degree (Centrality)

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Some AR mobile apps

- Snapchat

- Google Lens

- Augment: For retailers https://www.augment.com

- Amikasa (iOS): Home décor https://www.amikasa.com/

- Wanna Kicks (iOS): https://wanna.fashion/web-demo

- GIPHY world: https://giphy.com/apps/giphyworld

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Influence of augmented reality on shopping behavior

https://doi.org/10.1108/MD-02-2022-0136
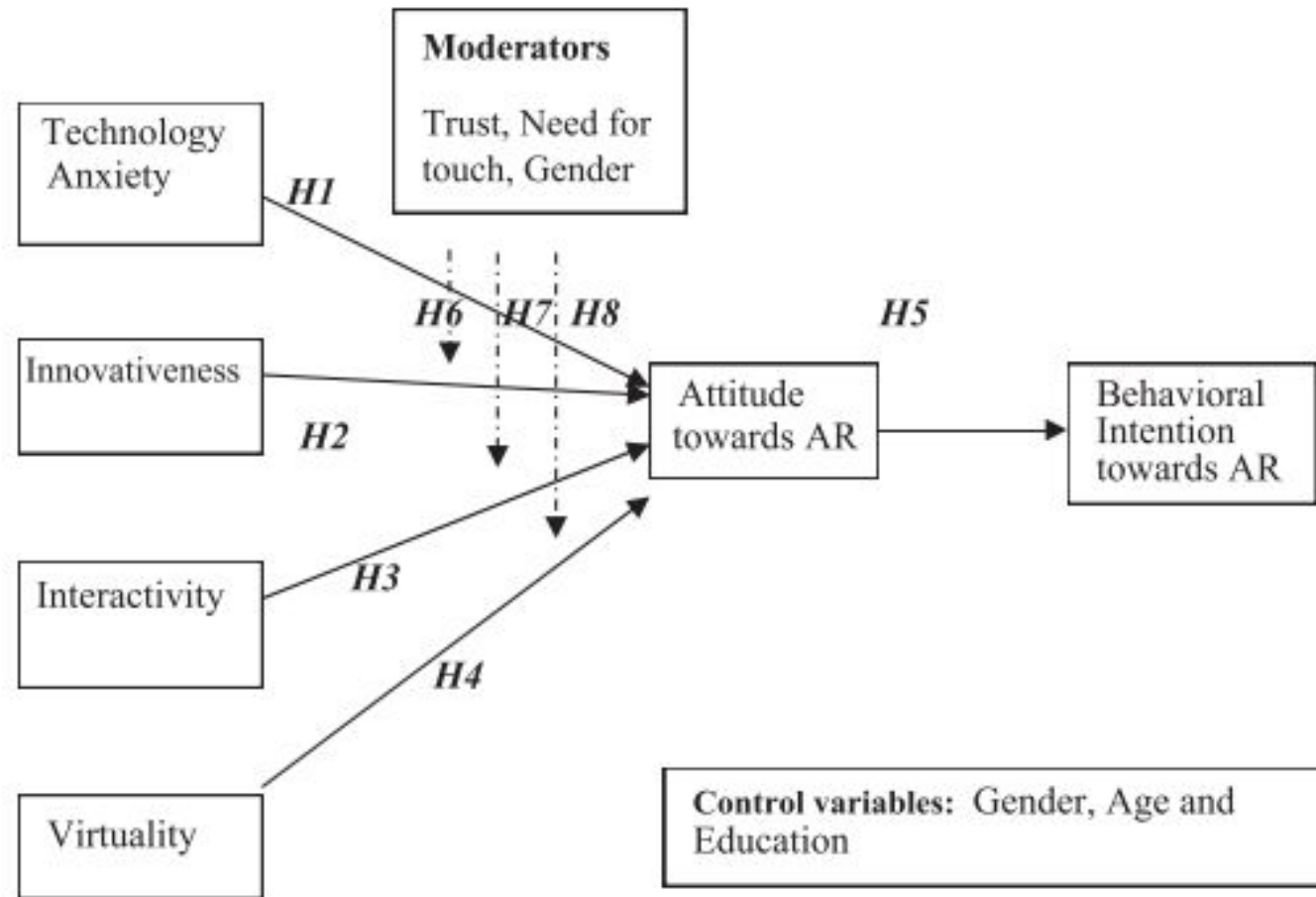
Effects of augmented reality technology characteristics on customer citizenship behavior

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Questions?

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How to find me:

SCOPUS: https://www.scopus.com/authid/detail.uri?authorId=57008894500

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Publons: https://publons.com/researcher/1749817/prateek-kalia/

Google Scholar: https://scholar.google.co.in/citations?user=Aqtyf1MAAAAJ&hl=en
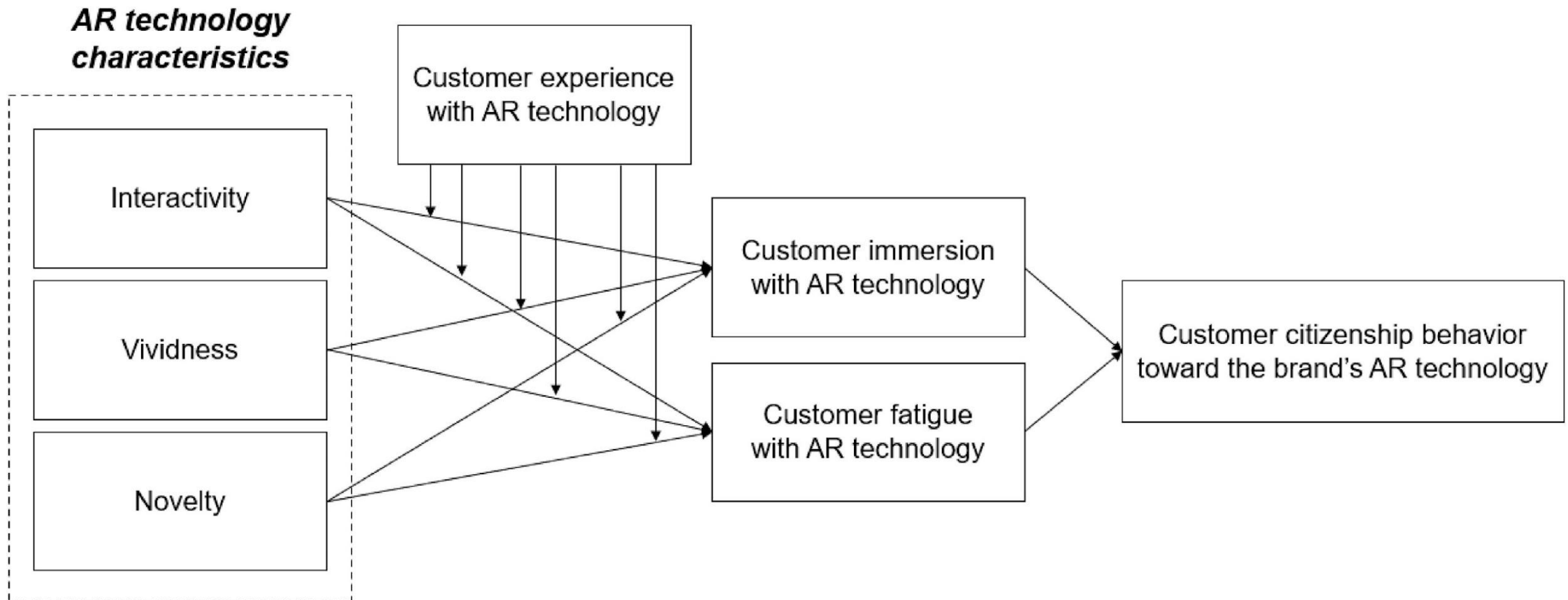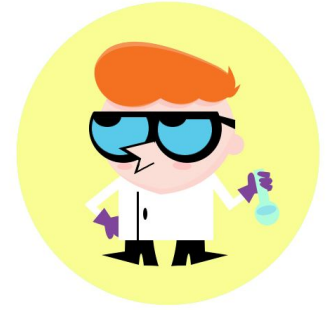
ResearchGate: https://www.researchgate.net/profile/Prateek_Kalia

SSRN: https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=1876118

…simply google "Cellulographics"

Academia: https://ptu.academia.edu/PrateekKalia

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