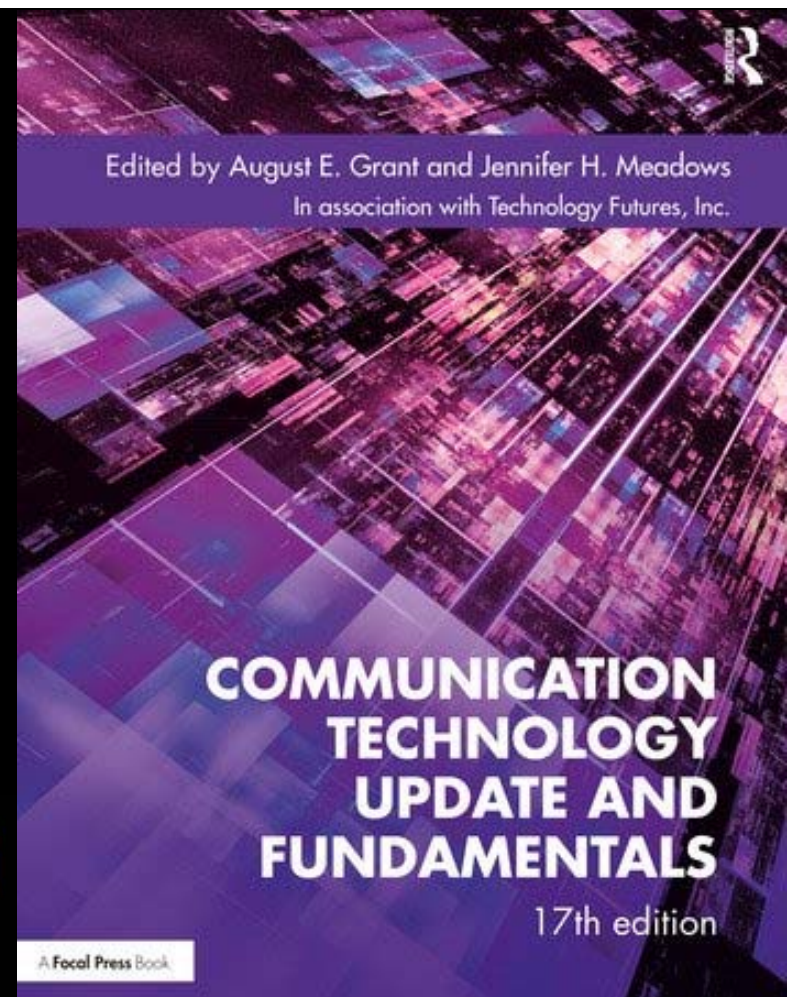




2022 Communication Technology Update



August E. Grant, J. Rion McKissick Professor of Journalism
University of South Carolina

TFI Technology Conference, January 20-21, 2022

Rockwell Predicted It:

I always feel like
somebody's watching me....
And I get no privacy.

Rockwell, 1984,
Motown Records

2022 Themes

- Surveillance
- IoT
- Cord cutting
- Work/Learn from Home
- Bandwidth Options
- Backlash

Surveillance

Dimensions of Surveillance

- Explicit
- Implicit

Explicit Surveillance



Implicit Surveillance

- Facial recognition
- Phone tracking
 - Shopping mall example
- Internet use
 - Aggregation of data across devices

Applications of Surveillance

- Security
- Law Enforcement
- Marketing

Internet of Things

New Connectivity Standard

Google


COMCAST



matter


HUAWEI

amazon

The Infineon logo consists of the word "infineon" in a blue, lowercase, sans-serif font. It is enclosed within a red, stylized swoosh that starts above the 'i', curves under the 'n', and ends below the 'n'.

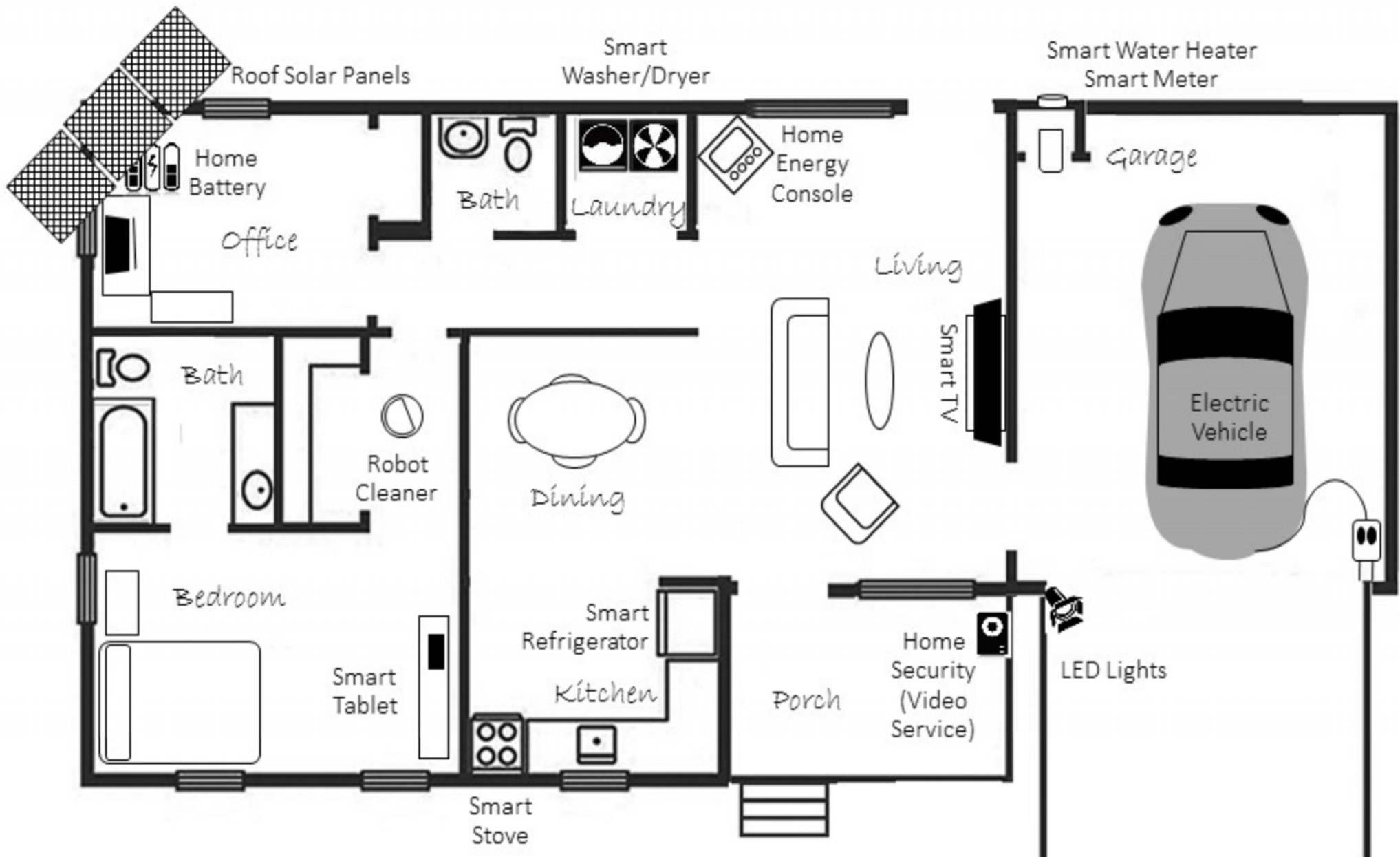
Elements of IoT Applications

- Data
- Network
- Processing
 - Local
 - Edge
 - Cloud

Internet of Things (IoT)

- Smart homes
- Personal assistants/smart speakers
- eHealth
- Automotive telematics

IoT=Smart Houses

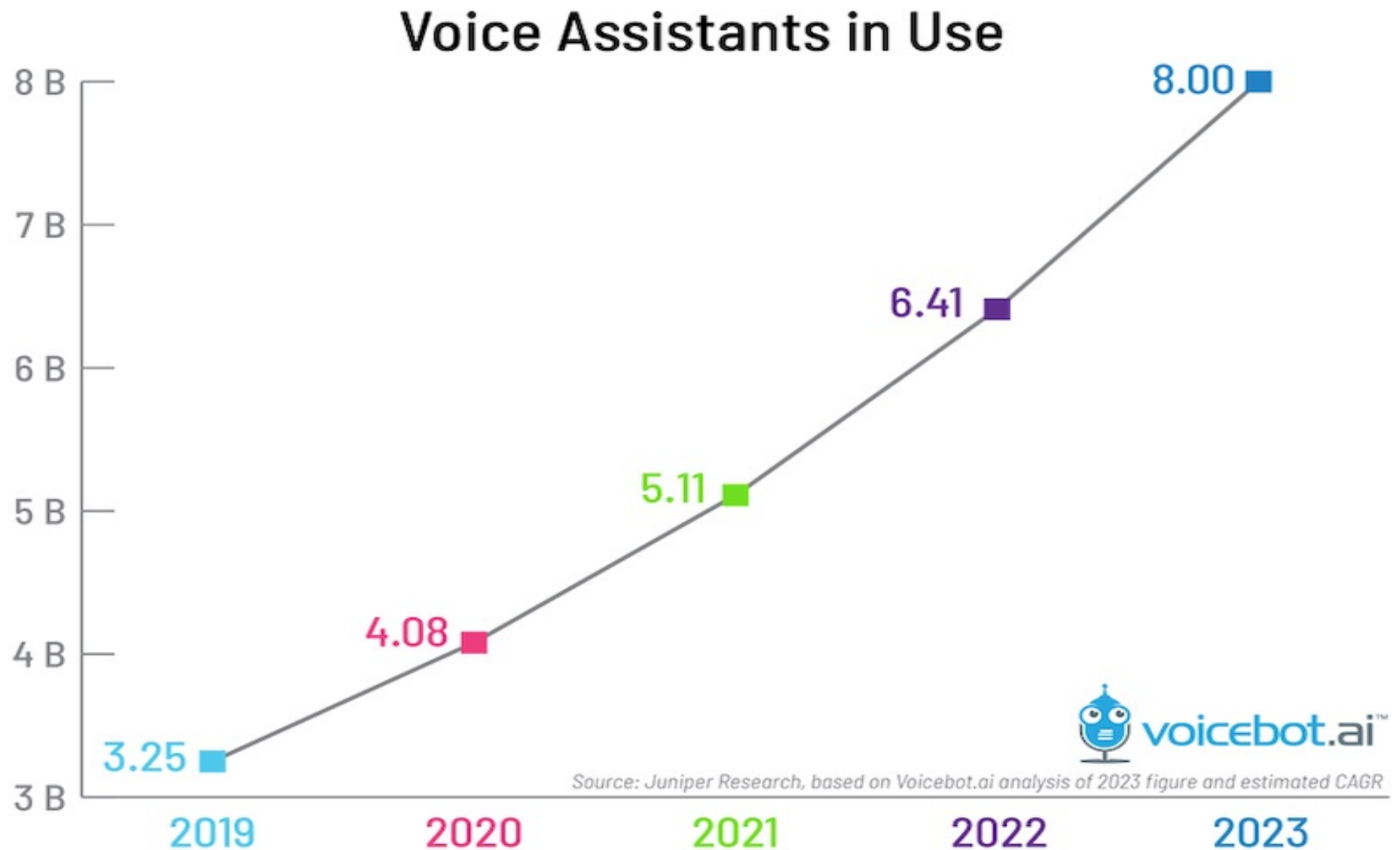


Personal Assistants

- Google Home and Amazon Alexa



Personal Assistant Adoption



eHealth

- Remote diagnosis
 - COVID-19 effect
- Monitoring
 - Wearables
 - Fitness devices
 - Other
- Home health care
 - Cost savings

eHealth



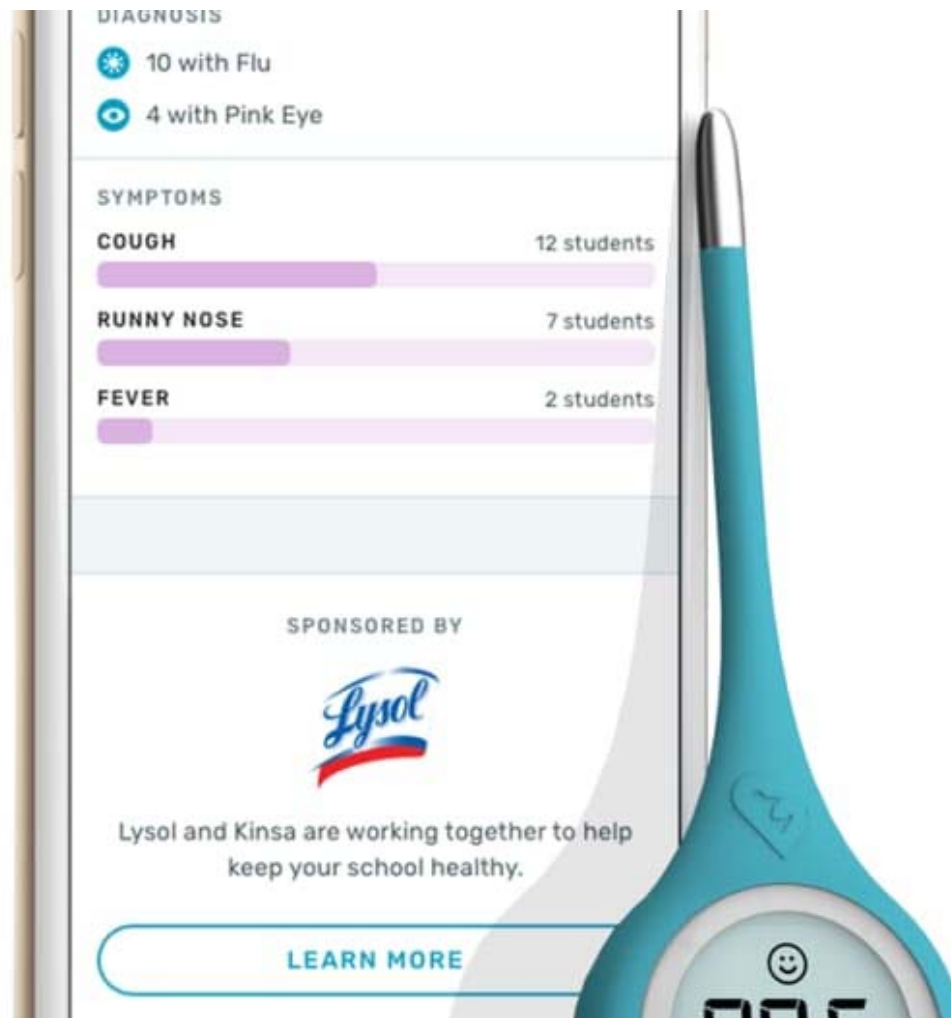
Sources: Fitbit, Kardia, Doctors on Demand

eHealth

- Today: Diagnostic devices
 - Examples:
 - Blood pressure
 - EKG
 - Blood Sugar
- Tomorrow: Networked devices
 - HIPAA and privacy
 - Control
 - Cost savings from prevention

eHealth and Pandemic

- Kinsa thermometer



eHealth

- Significant investments in health-related technologies and services
 - Cost savings from shifting
 - Place
 - Administration
- Increased focus on prevention and intervention
 - Much less expensive than treatment

Television

Too Many Streaming Options

Disintermediation

(2019-2022)



Reintermediation

(2022-????)

Impact of Disruption

- Acceleration of change
- Demise of weaker competitors
- Consolidation of players
- Opportunities for new entrants

Streaming Video

- Continued shift from broadcast and cable to streaming
- Shift leads to cord cutting
 - Younger viewers less likely to subscribe to cable

OTT/Streaming Today



Streaming Factors to Watch

- Major network shift in distribution strategy
 - CNN launching CNN+ streaming service
 - Broadcast networks streaming
 - CBS on Paramount +
 - NBC on Peacock
- New services that aggregate streaming subscriptions in a single subscription

More Golden Age of Streaming Content



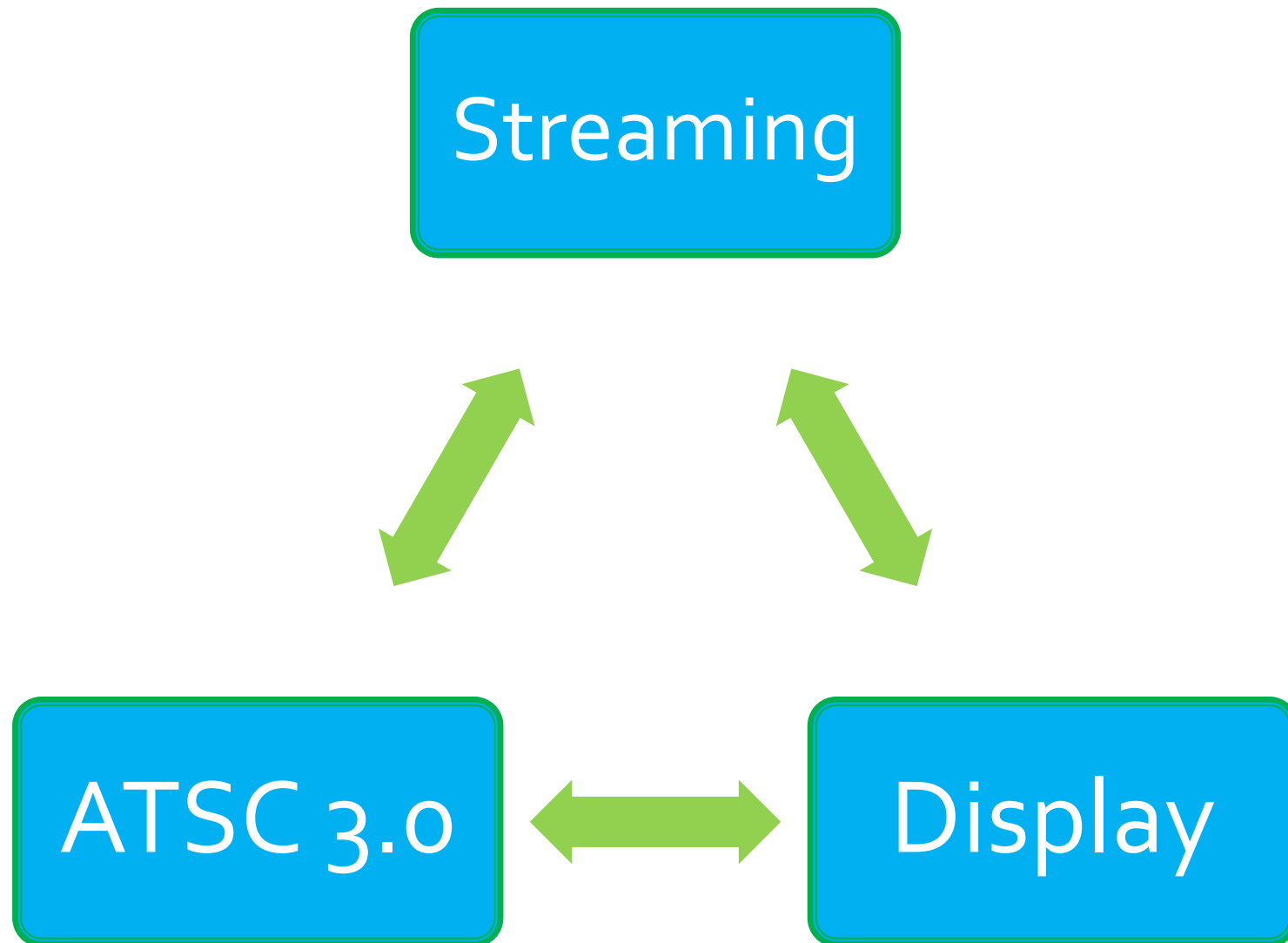
Cinema Comeback!

- Global revenues increased to \$21.4 B (vs. \$42B in 2019)
- Domestic revenues increased to \$4.5B (vs. \$11 B in 2019 and \$2B in 2020)
- *Spiderman: No Way Home*
 - First pandemic movie to gross >\$1B
- Continuing uncertainty about streaming window
 - Sequential vs. simultaneous

Impending Demise of Cable TV



TV is Evolving



ATSC 3.0 Broadcast Standard

- Delivery of 4K
- Up to 120 fps
- HDR
- Enhanced audio
- Mobile television
- Need for bandwidth
- Broadcast transition
- Targeted Advertising



ATSC 3.0 Progress

- Adopted by more than 200 TV stations across more than 40 markets
- So far, nearly invisible to users
- Note: revenue opportunities with digital services and targeted advertising

High-resolution TV

FULL HD
1920x1080

4K
3840x2160

8K
7680x4320



Next waves in TV

- Higher quality display
 - OLED, Mini-LED, QLED
- 8K
 - Primary a display technology
 - Will be used extensively in digital signage and TV production
- Frame rate (30, 60, 120, 240)
- HDR
- Key issue: Content (Streaming first)

Addressable Advertising

- Native in streaming and digital audio
- ATSC 3.0 Broadcast: Use of bandwidth to deliver and store multiple ads
 - Algorithms select the most relevant ads
 - Enables highly targeted advertising
- Significant revenue potential
 - Development of industry standard
 - Adoption needed by manufacturers, networks, & advertisers

Work/Learn from Home

Zooming Through Life



Work from Home

- Telecommuting becomes normal
 - Control over time
- Issues
 - Equipment
 - Security
 - Control
 - Network

Work from Home

- Workers:
 - Decrease in commuting time
 - More control over schedule
- Employers:
 - Reduced need for space (including utilities)
 - Reduced control

Remote Learning

- Synchronous
- Asynchronous
- Hybrid

- New techniques for:
 - Engagement
 - Assessment
 - Gamification
- Major issue: Access to devices and networks

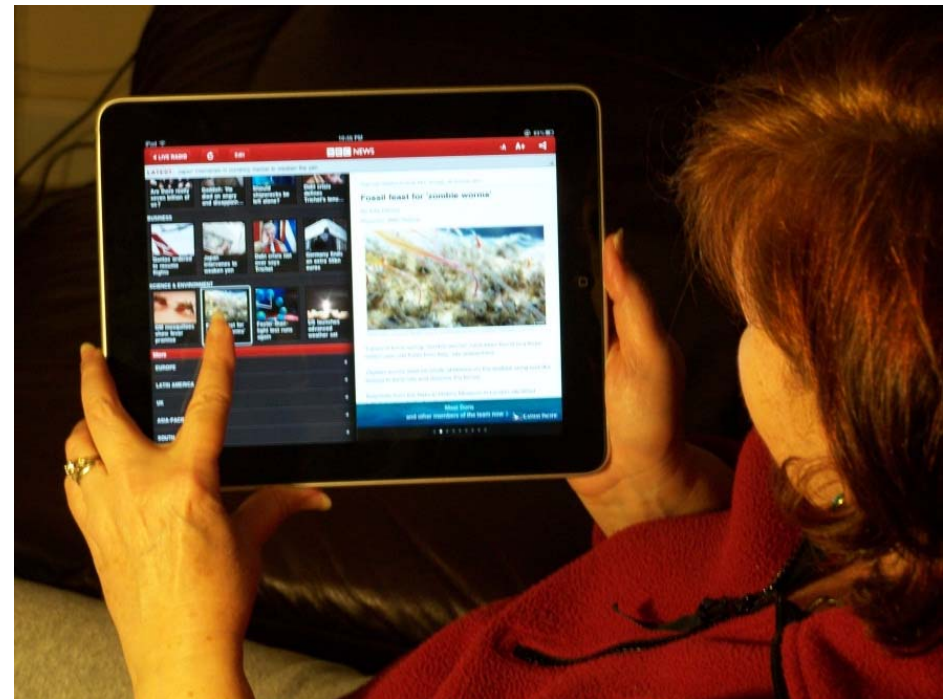
Remote Teaching

- Impact from pandemic will persist
 - More opportunities for remote teaching
 - Students can learn from home instead of infecting others
- Homework may evolve significantly

Residential Broadband Options

Internet Access Options

- Cable
- Wireline Telco
- 5G
- Satellite



Satellite ISP

HughesNet.



5G Impact

- Fixed wireless for in-home networking



Source: Samsung

Backlash

Backlash

- Social Media
- Cryptocurrency
- Cable Television
- Consolidation
- Privacy?

Continuing Antitrust Concerns

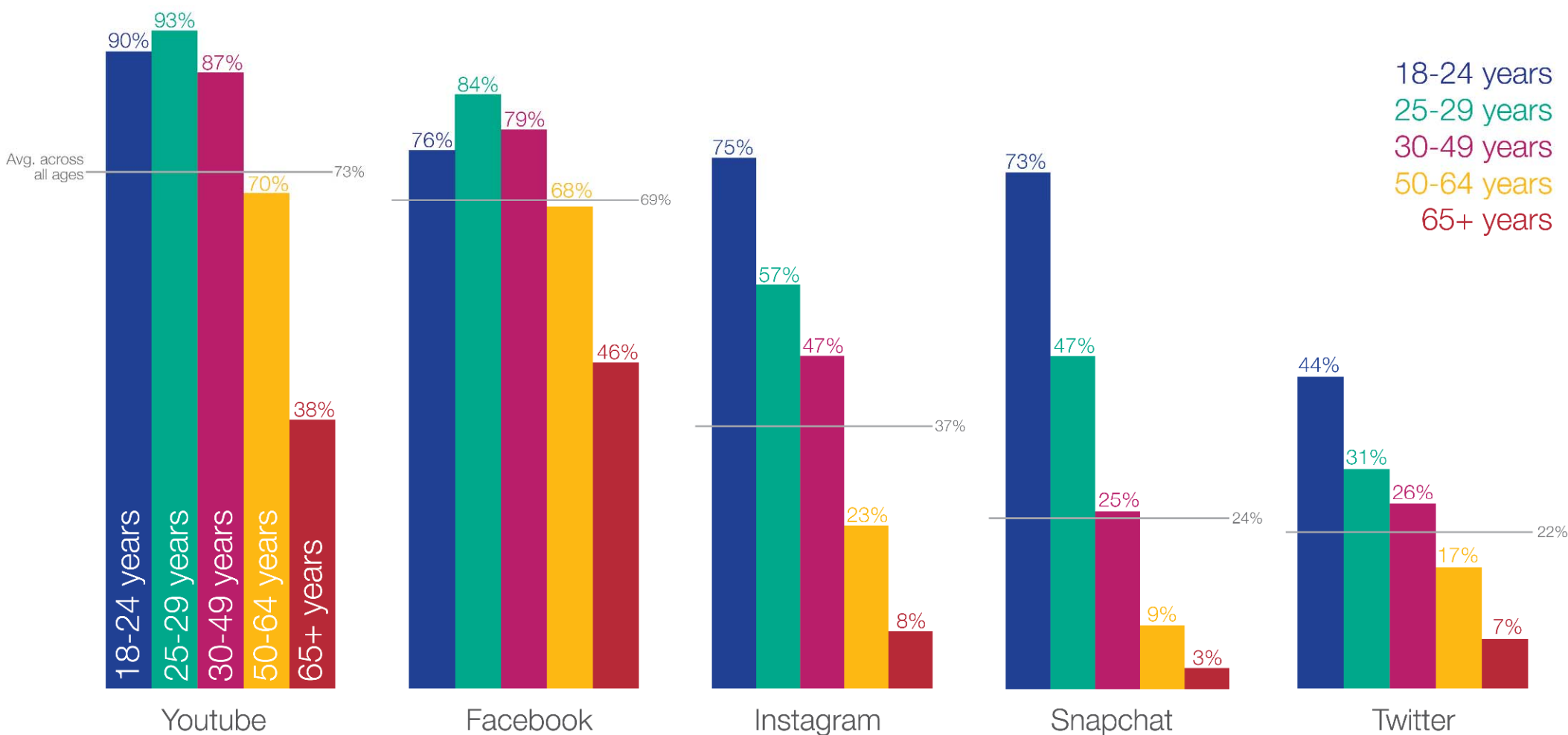
- Amazon/AWS
- Google
- Facebook

Social Media

Use of social media platforms by age group in the US

The share of adults in the United States who say they ever use the following online platforms or social media apps in 2019. This is shown by age group.

Our World
in Data



Video Games

Video Games: Revenues

- Estimated 2021 global revenues: \$154 billion

(source: Statista)

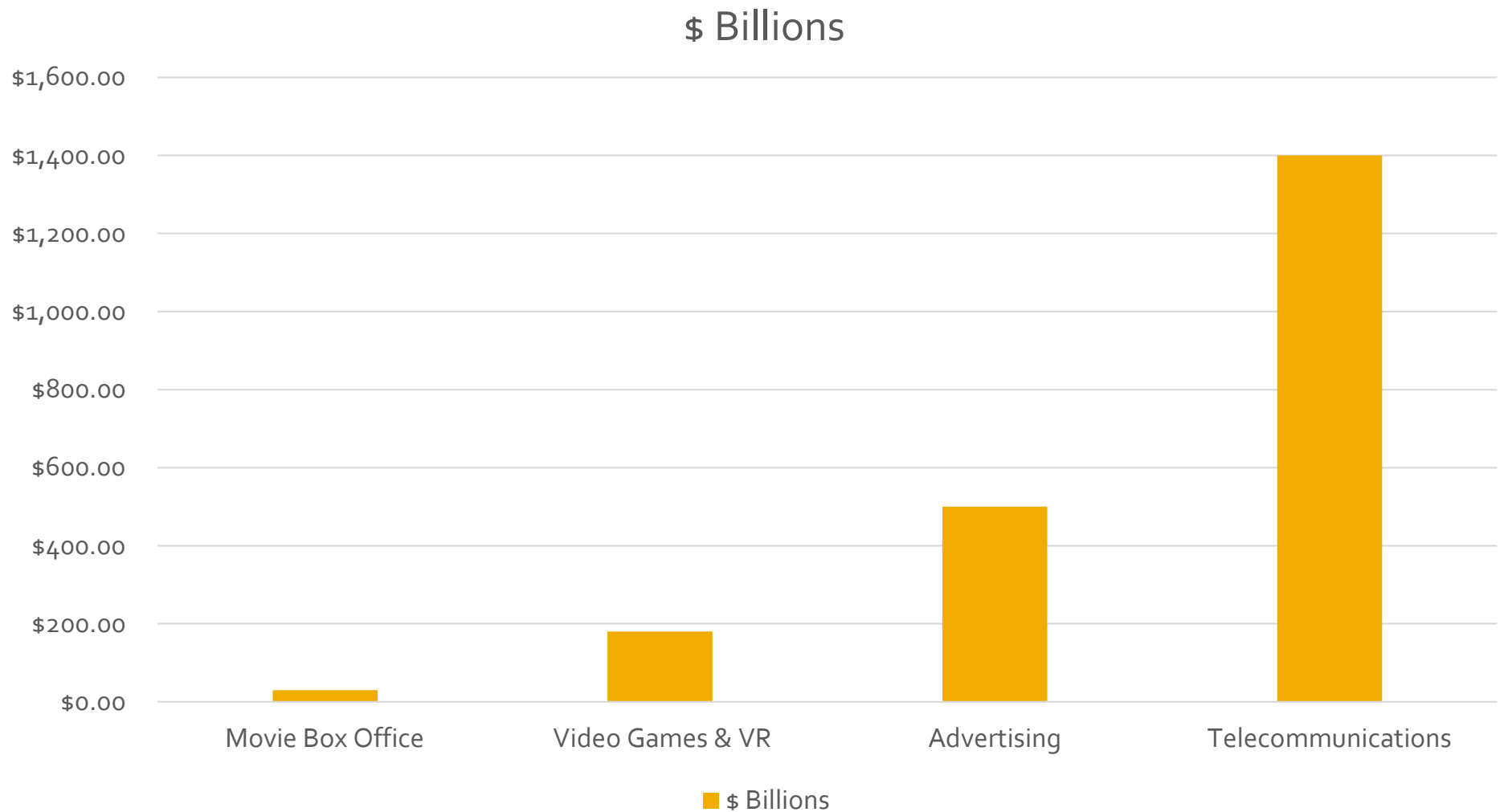
- Largest market: China
- Mobile gaming share: 70%

Most Popular Game: Fortnite

- 2021 revenues \$5 billion (est.)
- 2021 regular users: 350 million



Reminder: Relative Global Revenues



Extended Reality

- XR
 - Virtual Reality
 - Augmented Reality
 - Mixed Reality
- 360° video

VR and its cousins

Welcome to the Metaverse

- Many virtual worlds emerging
 - Gaming
 - Social media
 - Commerce
 - “Real Estate” in the metaverse
- How will they be connected
 - Lessons from 1990 Internet

Virtual Reality Creeps Along...



Practical VR Applications

- Games (limited)
- Training
 - Creation of experiences
 - Visualization
 - Examples: biology and physiology

Reminder: VR Limitations

- Health issues
 - Injury during use
 - Dizziness
- Accessibility
 - Visual impairment
 - Hearing impairment
- Time
 - 5-10 minute experiences

Augmented Reality



5G

5G Summary

- 5G is not a single technology, but rather a group of innovations that allow faster networks
- Short-term
 - More of a marketing tool than a useful tech
- Long-term
 - Creation of new capabilities that leverage high speed of compact networks

5G Impact

- Fixed wireless for in-home networking



Source: Samsung

5G Factors

- 5G is a group of technologies
 - Multiple bandwidths
 - Different range
- Capabilities of 5G are still being developed

...but...

- 5G is a marketing tool
- 5G misinformation is rampant

Other Trends

- AI
- Blockchain/
cryptocurrency

Artificial Intelligence

- Different approaches to decision systems
 - Examples:
 - Speech recognition
 - Facial recognition
 - Data analytics
 - Robotics
- BUT: AI is not (yet) comparable to intelligence

Blockchain and Cryptocurrency

- Fluctuations in Bitcoin value
- Competing coins
 - Thousands of speculative options
 - Dogecoin
- NFTs

Cryptocurrency Concerns

- Value is based only on perceived demand
 - Bubbles inevitable
- Environmental concerns
 - Producing cryptocurrency produces massive amounts of greenhouse gases
- Regulation of currency

Conclusion:

Disruptive change is
continuing...

Thank you!

More Info:

augie@sc.edu

Coming June 2022:

*Communication Technology Update
and Fundamentals, 18th ed.*

Communication Technology Ecosystem

