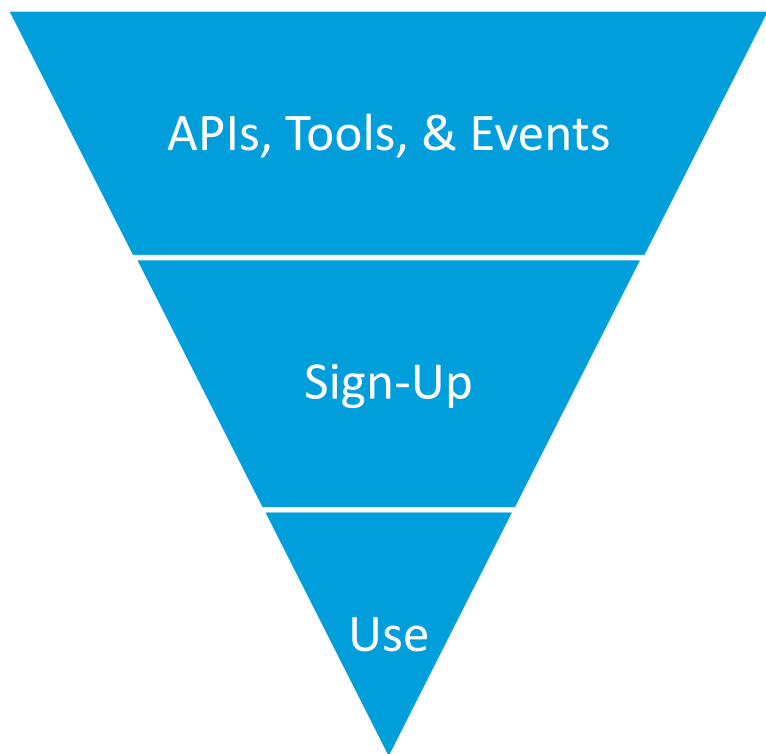


AT&T 5G Content Interviews & Survey Results

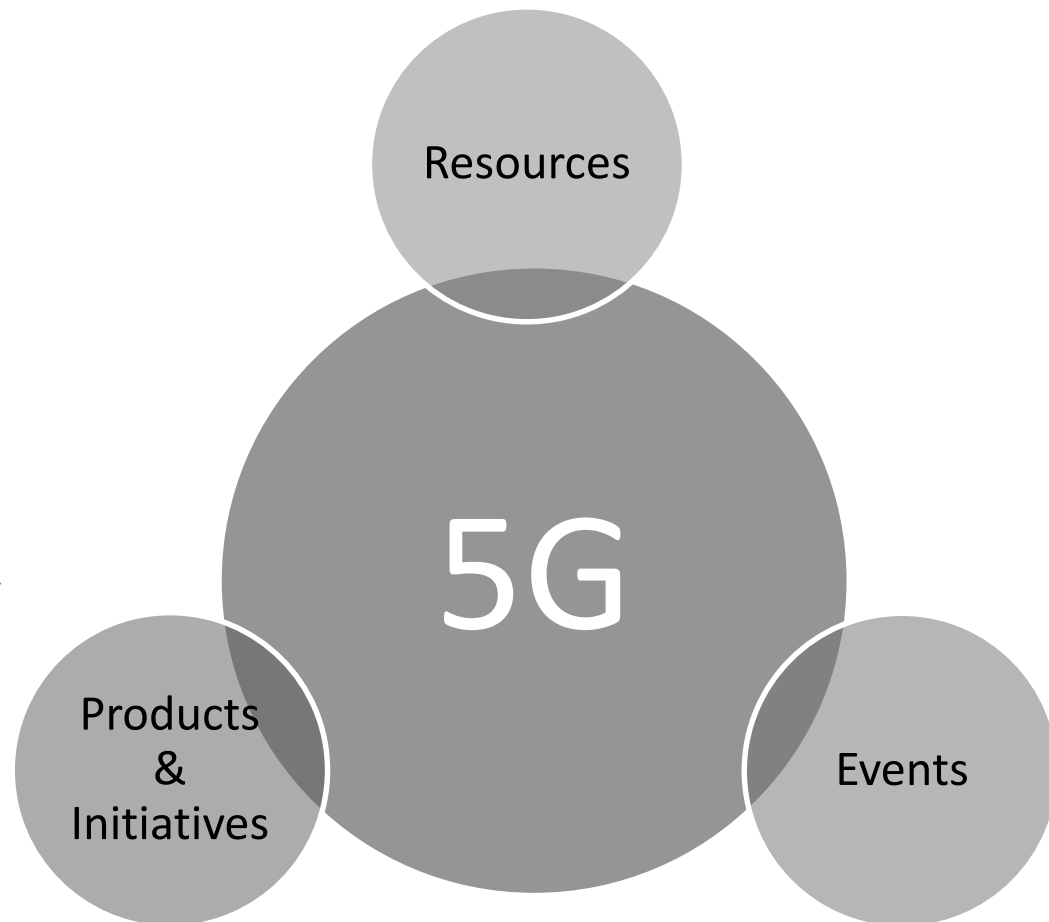
Jeff Skop



Developer Portal Evolution



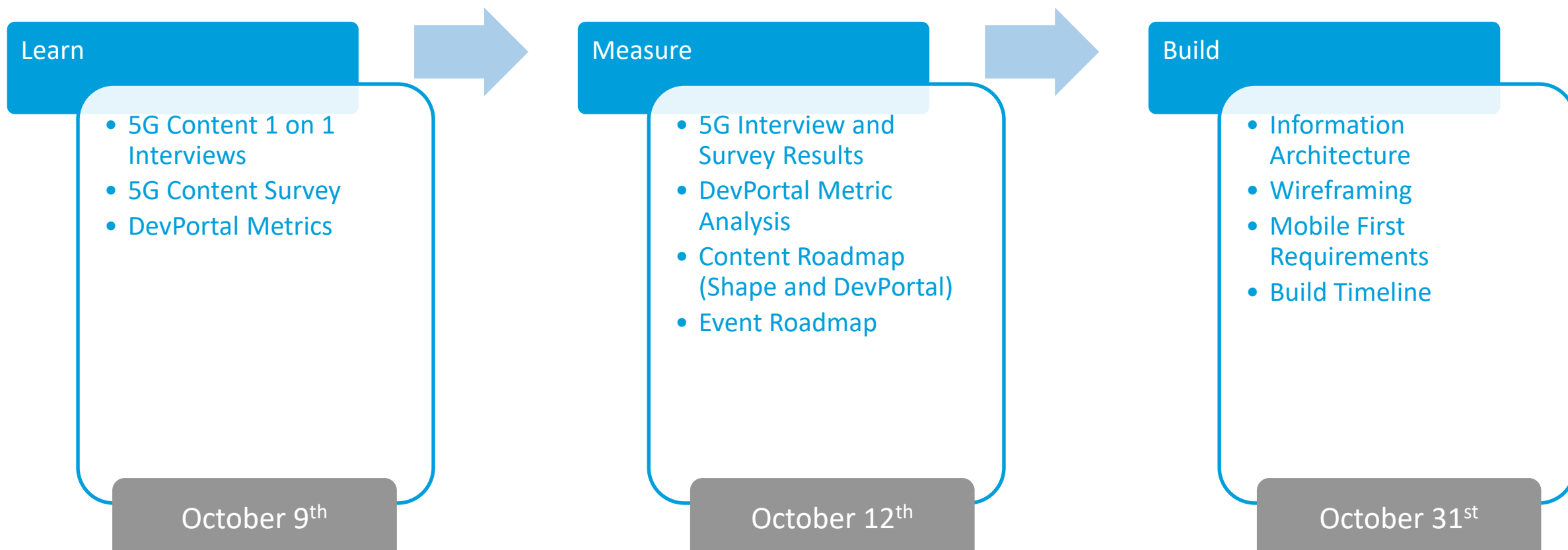
Current



Future



Developer Portal Evolution Timeline





Measure

5G Content Interview Results



Interview Results – Audience Profiles

Business Development

- Christian Keil, CEO, Direct.ly
- Robert Berlin, VP of Product Marketing, Rafay
- Tracy Dethlefs, Business Development, Hullabaloo.tv
- Rishi Ranjan, COO, GridRaster
- Huan Le, Business Development, Peer5
- Chris Yeoman, CFO and Business Development, Fovi3D

Developers / Technologists

- Mike Cuares, Technical Producer, Levr Studios
- Jason Jerald, Software Developer / Owner, NextGen Interactions
- Jeff Hartley, Technical Consultant, Lumina Networks
- Richard Metzler, PHD in Electrical Engineering, Machine Learning and Digital Processing with focus on network conditions, compression tools, & security



Interview – Summary Learnings

1. Create content that answers the question: Why should I care about 5G?

- AT&T has unique leadership and authority in entertainment and broadband market as it relates to 5G. Provide content to business professionals and technologists through real business case opportunities. Provide path for partnership opportunities. Explain how 5G will make money for these companies.
- Indicate details of 5G rollout plan.
- Provide technical details on how to use 5G network and indicate any special features or enhancements.
- Provide tools that test, optimize and/or standardize connecting to AT&T's 5G network.

2. A market strategy that leverages existing products and news sources

- Participants of interview were highly motivated to learn about 5G; however, that doesn't mean they go directly to AT&T for information. Leverage their existing information resources and events with AT&T sponsored 5G content that addresses their needs within their marketplace. For example, partner with Wireshark via plugin module for AT&T 5G testing loop or partner with Techcrunch with sponsored 5G Developer whitepaper, targeting an audience interested in 5G or 5G-related use cases.
- Create strategy that disseminates content from broad to focused audiences: reach broad audience and grab attention (news articles), provide insights (blogs from industry experts) and ***most importantly demonstrate expertise and thoroughness (white papers)***.

3. Avoid pitfalls of content that is too broad, confusing or not part of core competency.

- Audience is tired of hype or if technology is not real or widely ready until 2 to 3 years. If there is an initial rollout or first wave (6 months to a year), give as much detail as possible for early adopters who can benefit.
- Make sure content is highly valued or risk negative brand association and reluctance for audience to re-engage with source.



Interview Results – Summary Answers

1. What is your main purpose for learning about 5G or related topics?
 - Business professionals want to know when and how widely 5G will be deployed, what are the main business cases and how they partner with AT&T.
 - Developers and Technologists need to get under the hood with technical specifications, learning details of new features/functions of the technology. How do I implement?

“You have to answer this question: Why do I care about 5G?” – Jason Jerald, NextGen Interactions



Interview Results – Summary Answers

2. Are there companies or brands that you better associate with these topics? What is your assumption about how AT&T can help related to these topics?
 - Business Professionals, Technologist and Developers all drew from their industry focus for sources they referenced.
 - Most felt that major carriers, Nokia and Ericsson were key players in 5G space.
 - All agreed that AT&T's key messaging around 5G should answer questions around 5G's deployment (locations/timeline), partnership opportunities, and network specifications/feature set.

“The source of truth is dead. What you end up with are fragments of truth provided by various companies in the marketplace pushing their priorities/agenda.” Jeff Hartley, Lumina Networks



Interview Results – Summary Answers

3. Does AT&T brand help or confuse trustworthiness of the content shared? Does section title or location of the content influence the level of authority associated with the content?
 - Business Professionals, Technologist and Developers all agreed that news is primary jumping off point to learn about new or future technologies but only with superficial depth.
 - Blogs can provide deeper perspective, but source authority is critical when determining motivation to read 5G material, e.g., Director of RAN/Wireless Solutions vs. Tech Enthusiast.
 - White papers are best source of information for individuals/companies with direct or tangential 5G impact since they will prioritize new products based on 5G relevance/readiness.
 - Some indicated potential confusion if AT&T focuses on AI history vs. AI and AT&T's 5G Network, indicating that AT&T's focus is entertainment and communication services.

"I find that my first impressions of an information source weigh most significant on my perception of their authority. In other words, if an article lacks depth or accuracy, I almost never return." – Christian Keil, Drect.ly



Interview Results – Summary Answers

4. Response to some 5G-related topics and article titles (slide 35): a. Depth b. Breadth c. What topics would you want available if missing?
 - Business professionals found article one to be most relevant to their needs, citing use cases, business cases and coverage plan timelines as primary interests .
 - Note that 2 of 7 also voted article two most relevant based on technical details they expected to find.
 - Developers and Technologists found article two most compelling due to development-centric focus where they get technical details on how to implement 5G .

“3rd Article title seems too broad, and there’s already too many articles today that talk about the hype.” – Richard Metzler, Latakoo



Interview Results – Summary Answers

5. Beyond reading articles, what tools, programs or how-to documents would you hope to find?
- Business Professionals, Technologist and Developers all pointed to their industry-specific resources and tools, but were not sure if any tools are available for 5G.
 - Developers and Technologists all felt having a 5G testing loop would be useful with the ability to stress test against a real world 5G network environment.
 - All participants referenced YouTube and Facebook User Groups for tried and true how-to sources.

“Any tools that help developers standardize and optimize development of apps for 5G/Edge Computing would be useful” – Robert Berlin, Rayfay



Interview Results – Summary Answers

6. What 5G events, devlabs and/or hackathons if any would you hope to attend? What would make an event like this a success for you?
- Similar to previous question around tools and how-to references, Business Professionals, Technologist and Developers all pointed to their industry-specific events for sources of inspiration and would be interested to learn more about 5G at these events.
 - Business Developers want path to partner and build business cases.
 - Developers want to view/participate in live 5G Network connection, monitoring stats on network/latency performance that are tested against their respective products.

“To participate in a 5G related event, I need to engage with solutions available in the first wave of deployment, not if a solution is still 2 or 3 years out.” – Rishi Ranjan, GridRaster



Measure

5G Developer Survey Results



Developing for 5G Survey

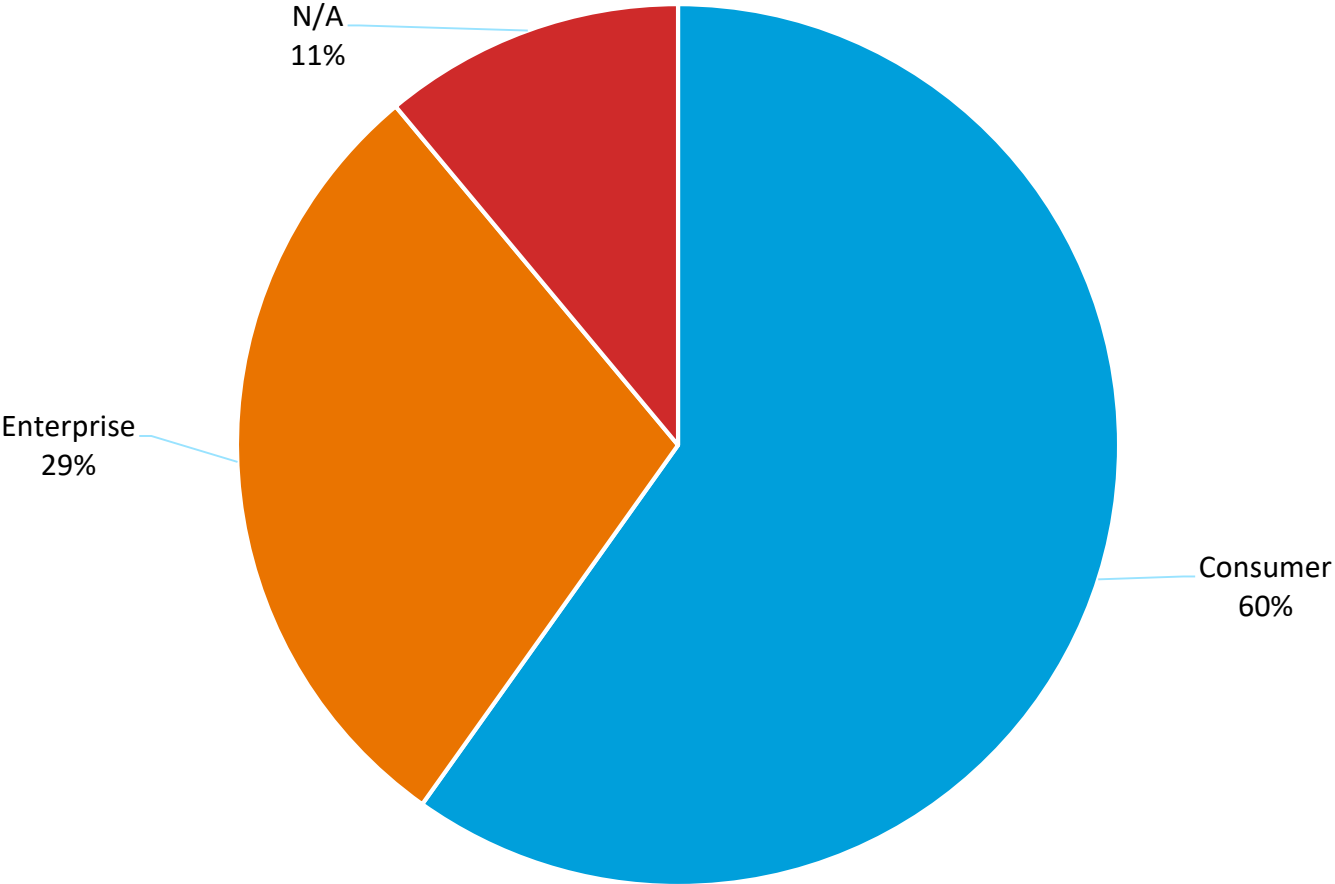
- Sent to 40k+ email addresses
- 660 total responses (1% response rate)

Summary:

- Most of our survey respondents are involved in **consumer app development** that rely on **cloud connectivity** across many different industries
- The community is **VERY** interested in learning everything there is to know about 5G and is searching for info occasionally, if not monthly
 - Among top sources for finding information include online developer communities (Stack Overflow, forums), tech news sites (RCR wireless), Developer Sites (AT&T, Samsung, Google)
 - They are largely interested in how 5G can help their application with **latency reduction, data volumes / capacity (mobile broadband) and increasing the number of connections between devices**
 - They're most excited about 5G use cases like better broadband / mobile access for home broadband services, new IoT / M2M applications /connected devices, VR/AR/MR services and video delivery to mobile devices
- The community is looking for **education and training** on 5G:
 - Standards development, roadmap, details on launch and devices
 - Use cases, workshops, dev test kits, webinars, videos, white papers, example code, hands on training, architecture diagrams, technical documents, ROI benefits

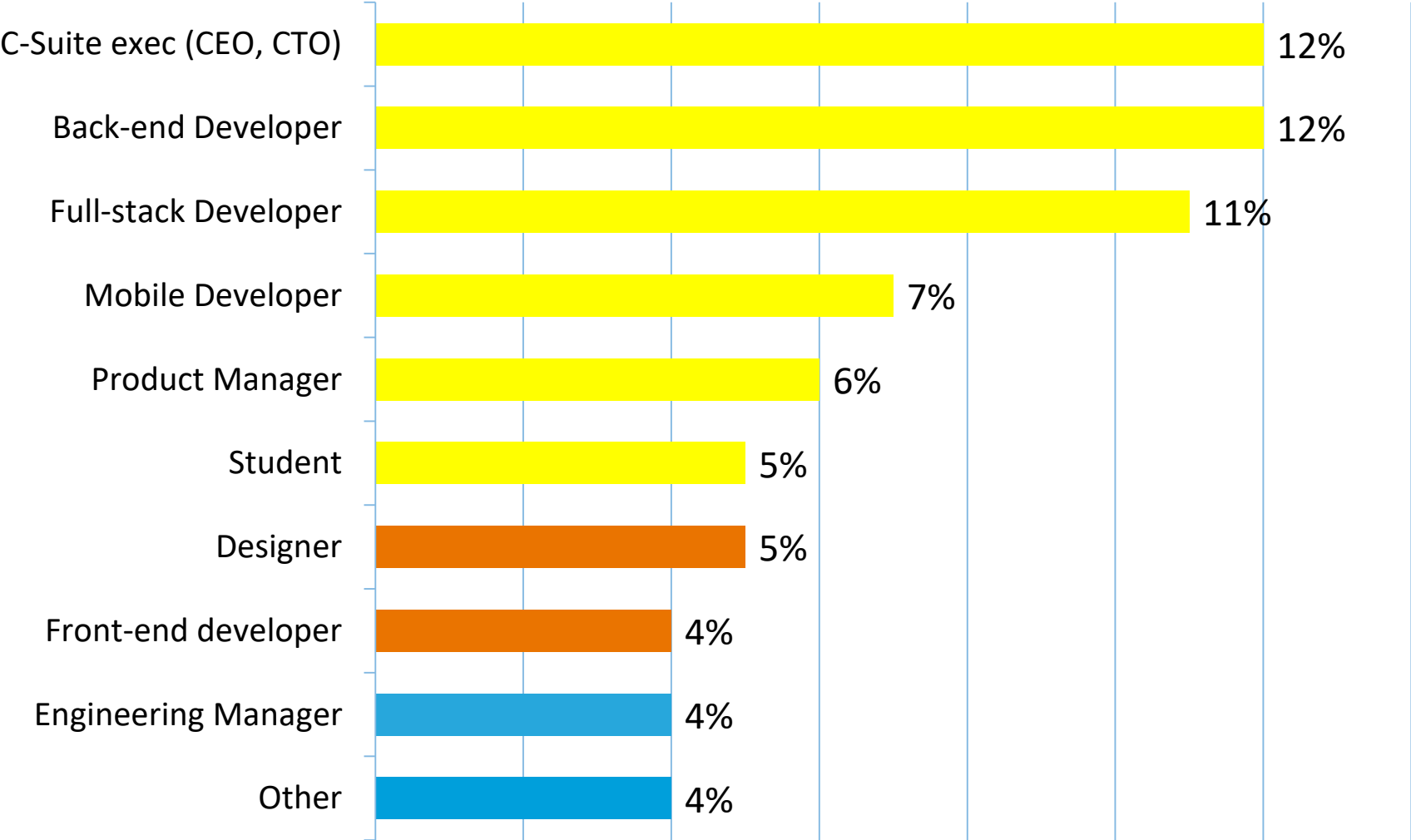
Developing for 5G Survey

Question 1: What type of applications are you primarily creating?



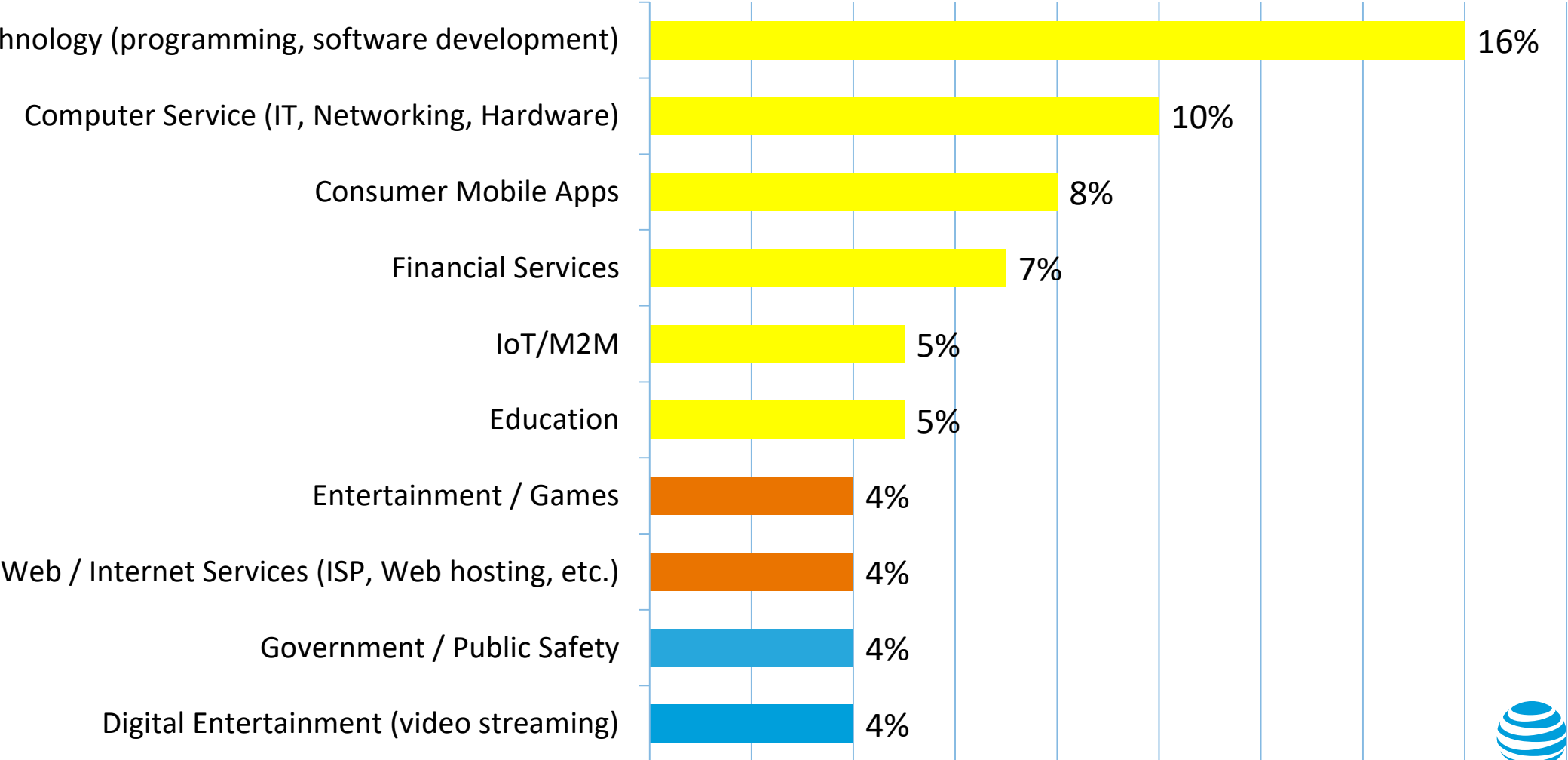
Developing for 5G Survey

Question 2: What type of role do you have today? (Top 10 responses listed)



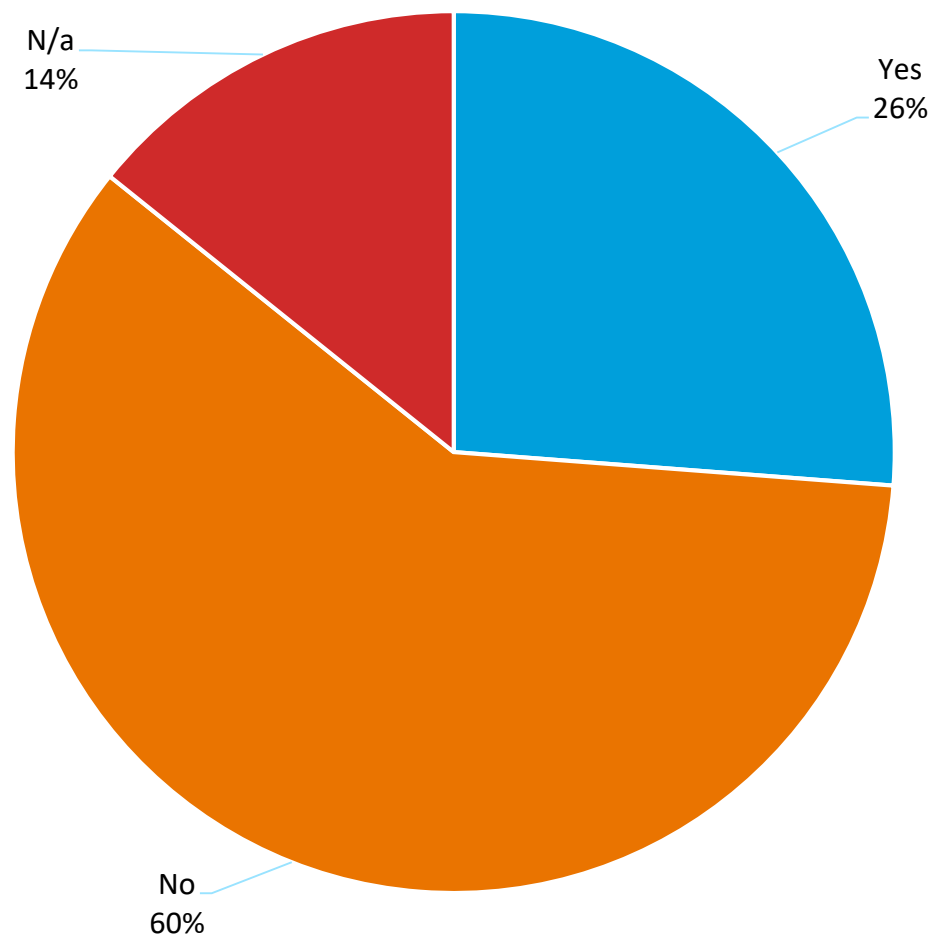
Developing for 5G Survey

Question 3: What type of industry do you primarily develop for? (Top 10 responses listed)



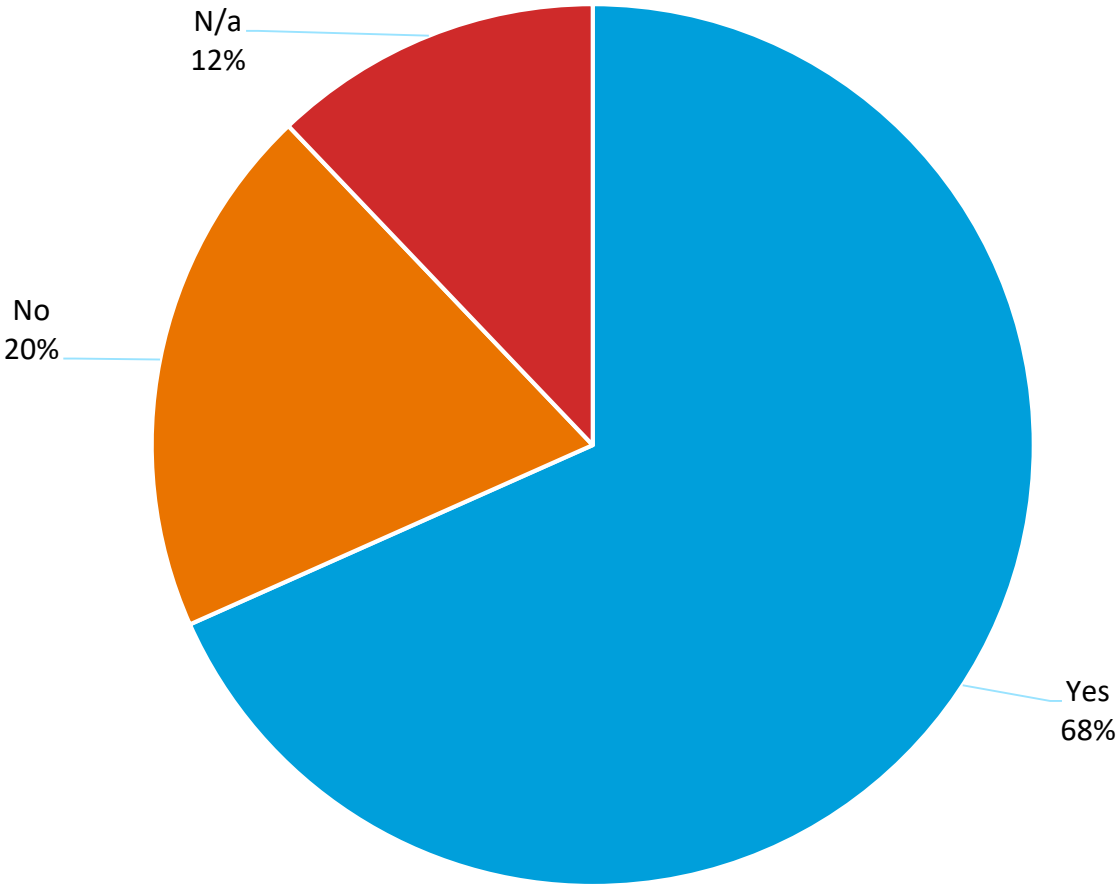
Developing for 5G Survey

Question 4: Is your application currently available in an app store?



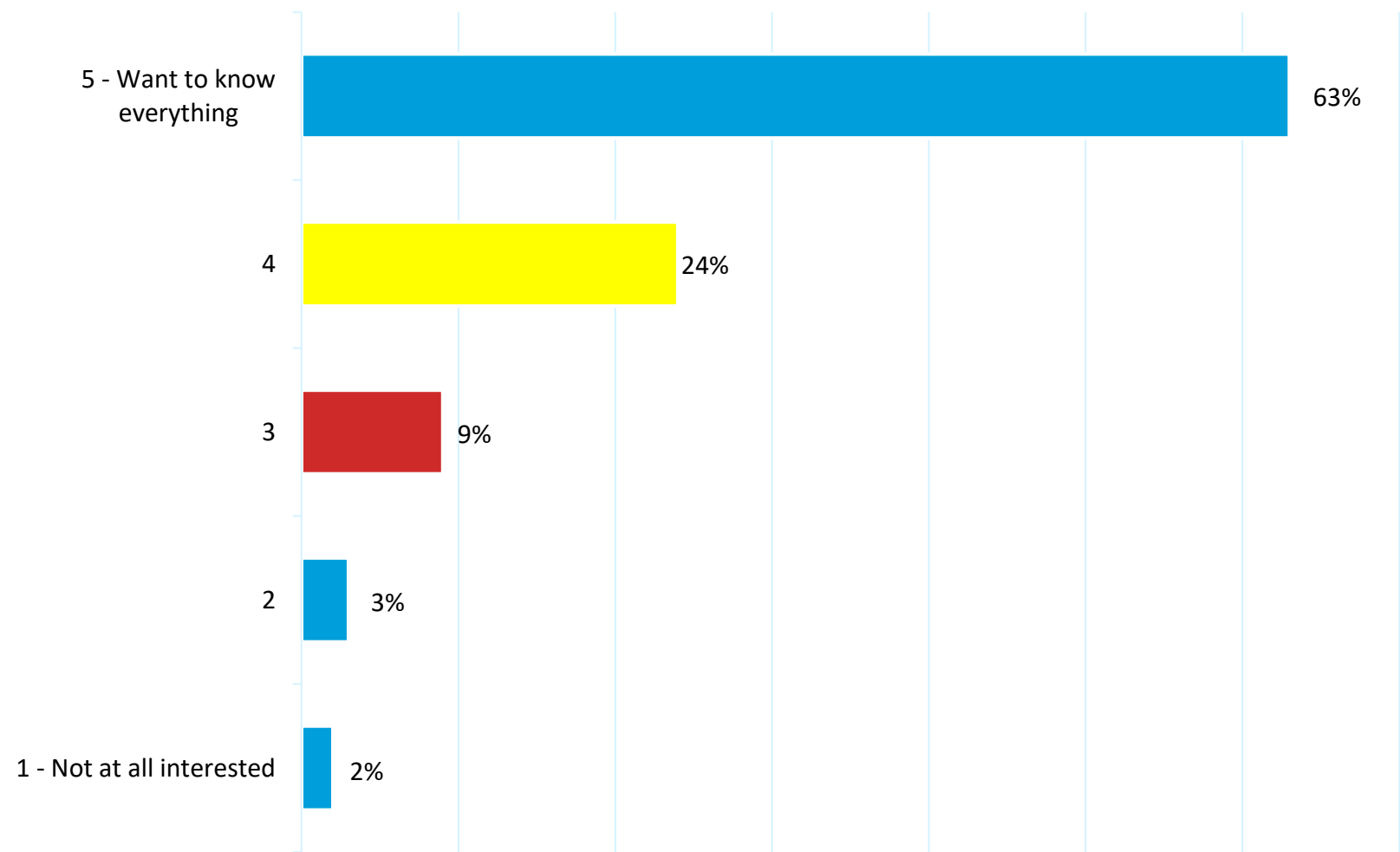
Developing for 5G Survey

Question 5: Does your application rely upon cloud connectivity?



Developing for 5G Survey

Question 6: On a scale of 1-5, (5 being want to know everything, 1 being not at all interested) how much do you want to know about 5G?



Developing for 5G Survey

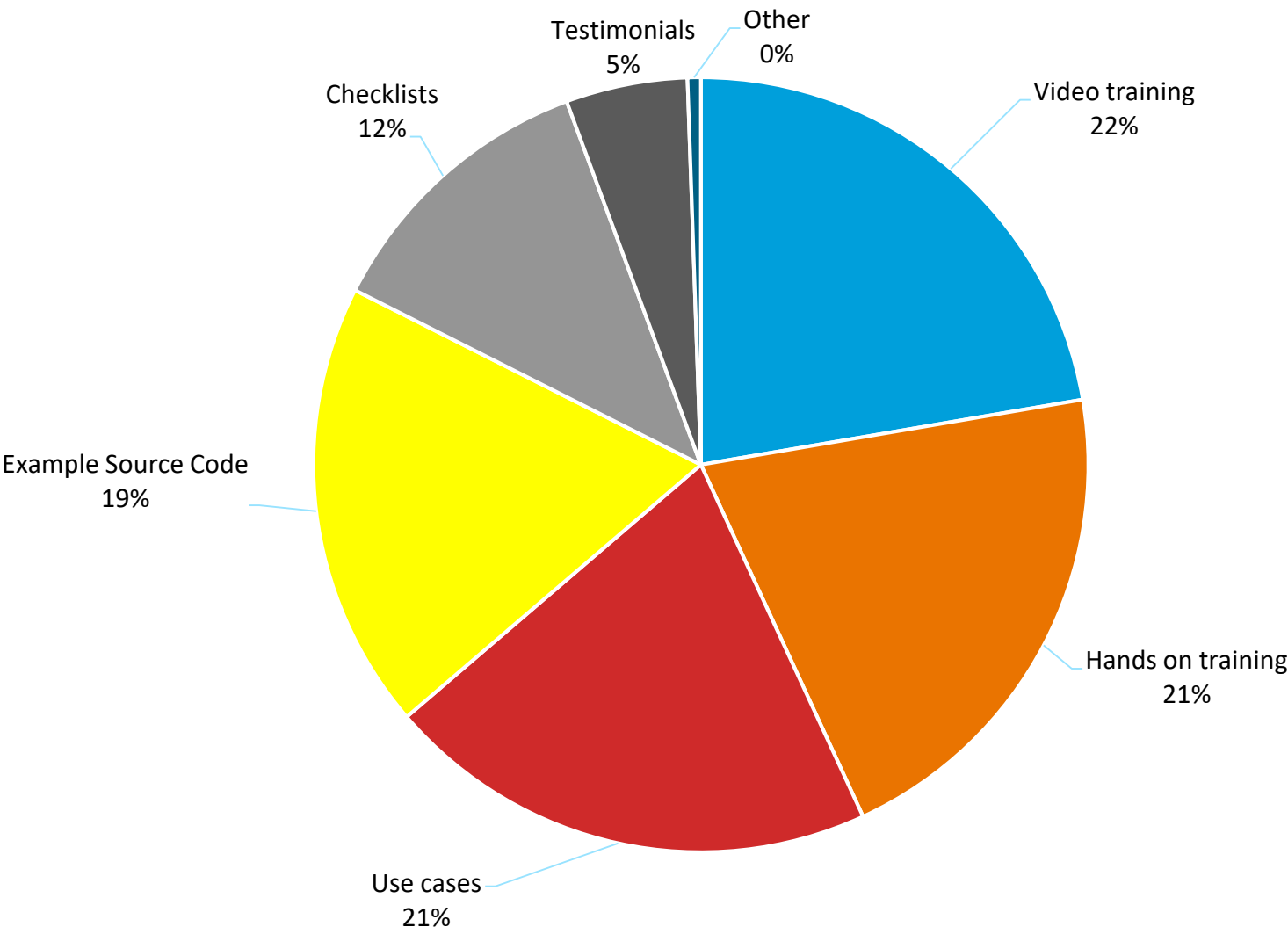
Question 7: Rank how these 5G improvements may help within your current application:

5G Improvements	Rank (1= Most important)
Latency Reduction	1
Increase in connected devices (IoT, M2M)	2
Data volumes and capacity	3
Services that consume more bandwidth	4
New vertical marketing opportunities (retail, manufacturing, etc.)	5



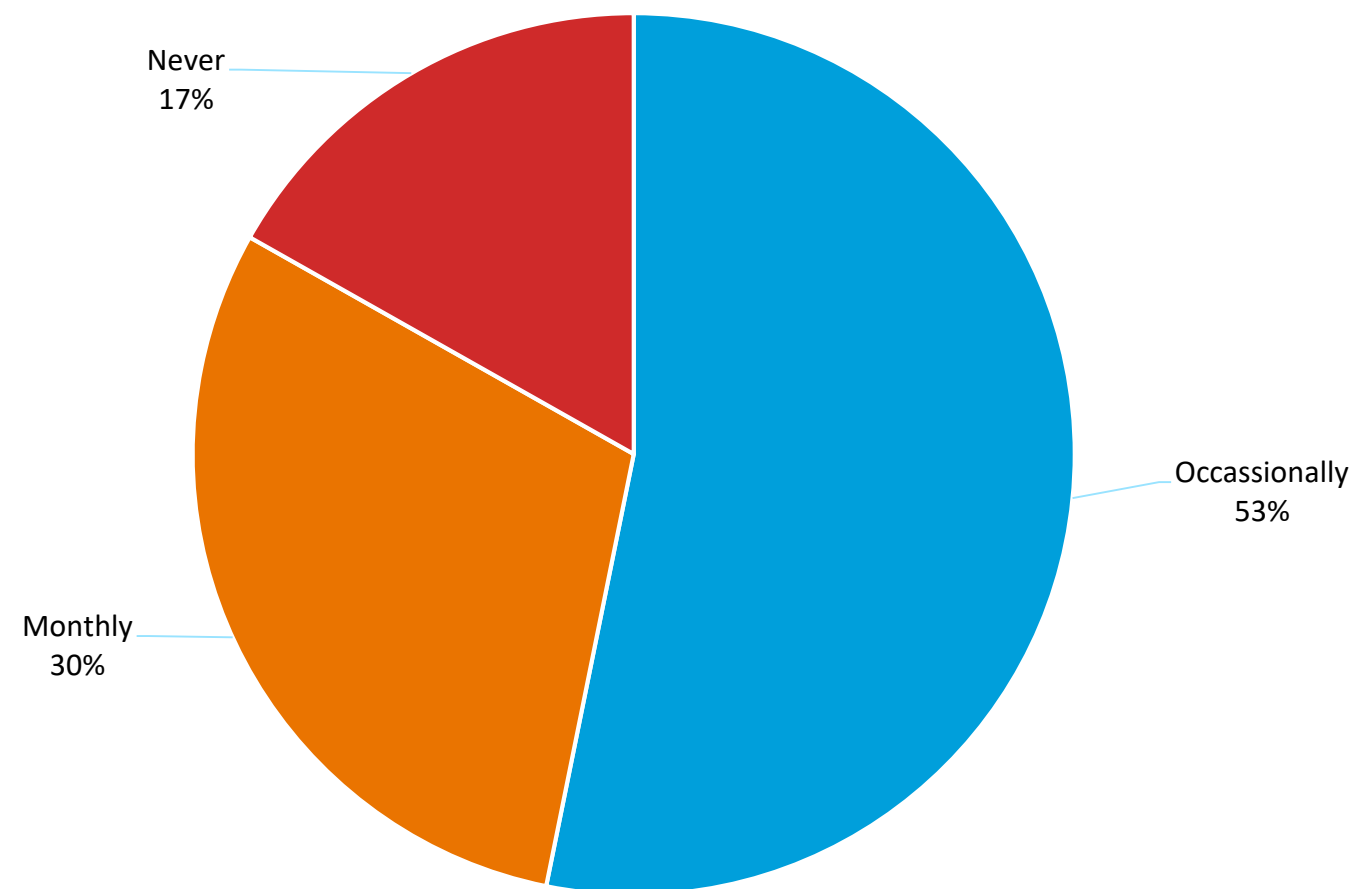
Developing for 5G Survey

Question 8: What kinds of resources about 5G development will help you in making these improvements?



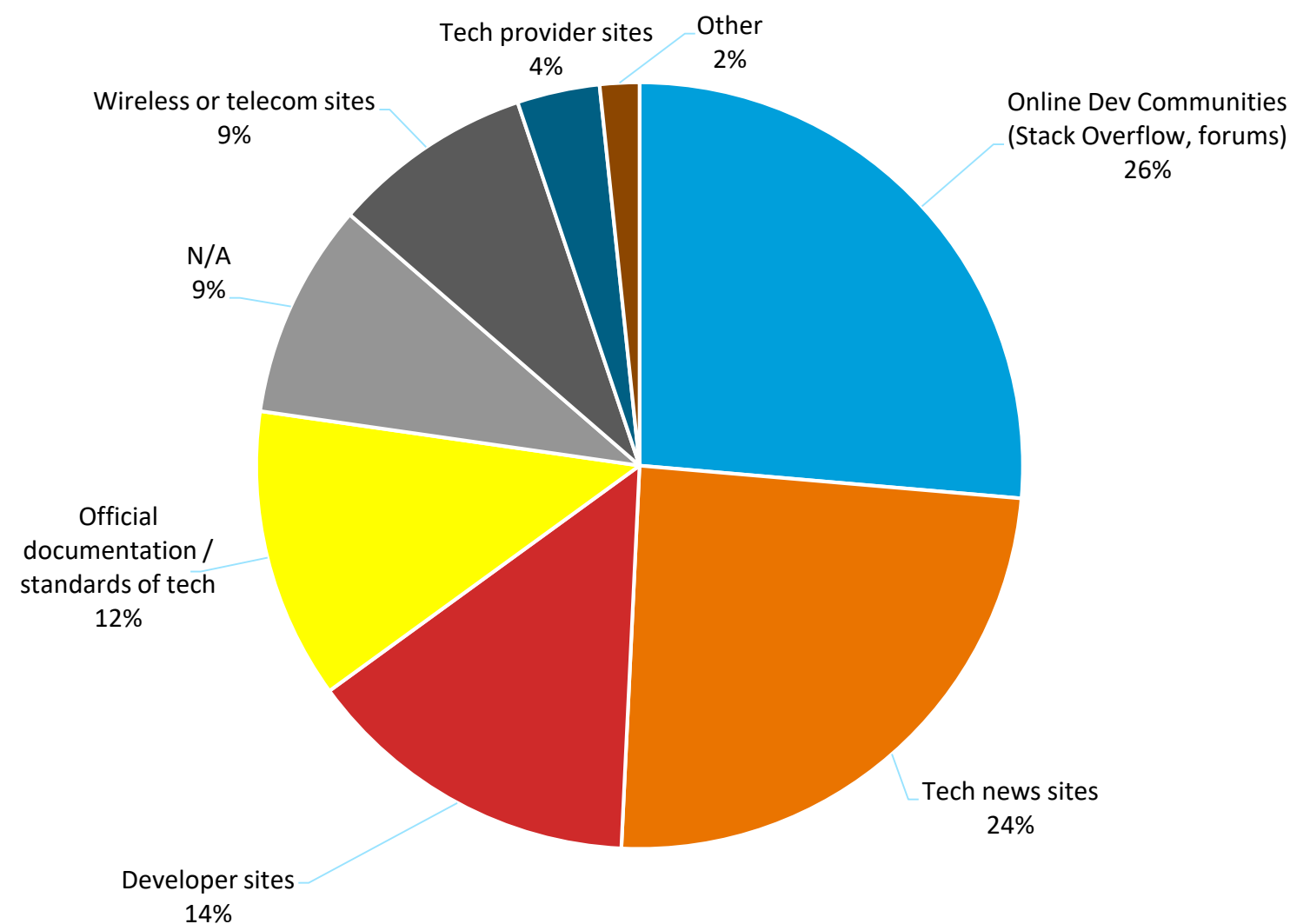
Developing for 5G Survey

Question 9: How often do you search for information on 5G?



Developing for 5G Survey

Question 10: Where do you most often look for information on 5G?



Developing for 5G Survey

Question 11: How can AT&T specifically help you learn about and prepare for 5G?

Education

- Keeping latest **information and training** on developer.att.com
 - Standards development, details on launch and devices
 - Timeline/roadmap, when can developers have access to test with 5G
 - Use cases, workshops, dev test kits, webinars, videos, white papers, example code, hands on training, architecture diagrams, technical documents, ROI benefits
 - 5G impact pricing for IoT
 - Hardware for testing
 - How to improve app development with 5G
 - Power consumption improvements
 - Fringe signal service availability
 - Economies of scale for low bandwidth M2M applications vs price competitive with other low bandwidth telemetry (ie: vsat)

Developing for 5G Survey

Question 12: Aside from your current application, what else makes you excited about 5G (where 5 = very excited and 1 = not excited):

5G Use Cases	What % Very Excited (scored it 5)
Better broadband, mobile access for home broadband services	57%
New IoT/M2M applications (connected devices)	56%
Virtual / Augmented / Mix Reality Services	48%
Video delivery to mobile devices	45%
Smart city systems	42%
Next generation video / TV services	41%
New vertical market applications (smart manufacturing, medicine, robots, etc.)	40%
Retail applications	30%



Interview and Survey Recommendations

- **Align marketing strategy with existing audience behavior**
 - Leverage Existing Developer Information Sources with in-body sponsored AT&T 5G Content.
 - Investigate notable 4G LTE sources and emerging 5G content sources as baseline for where/what/how to communicate 5G content.
- **Key 5G content formats:**
 - White Papers
 - How-to Videos
 - Forums
 - Blogs by Industry Experts and Insiders
- **Key 5G content interest:**
 - Latency Reduction
 - Data Volumes / Capacity (mobile broadband)
 - Increasing the number of connections between devices
 - 5G Coverage Rollout (locations and dates)



Build



Next Steps by 10/31

- Information Architecture
- Wireframing
- Site Requirements
- Site Timeline



Appendix



Learn

5G Content Interview Plan



Who is interested in 5G?

Audience

- Consumers*
- Developers
- Business Professionals

Top Use Cases

- AI
- eSports
- Gaming
- AR
- 360 video, 4K
- Car Automation, Health, Smart Cities

* Note: Consumer audience is beyond scope of this test; however, 5G availability is a key interest for all audiences.



What are we testing?

Intent

- Learn
- Build
- Distribute/
Monetize

Types of Content

- Resources
- Events
- Products / Tools



5G Content Interview Questions

1. What is your main purpose for learning about 5G or related topics?
2. Are there companies or brands that you better associate with these topics? What is your assumption about how AT&T can help related to these topics?
3. Does AT&T brand help or confuse trustworthiness of the content shared? Does section title or location of the content influence the level of authority associated with the content?
4. Response to some 5G-related topics and article titles (slide 35)
 - a. Depth
 - b. Breadth
 - c. What topics would you want available if missing?
5. Beyond reading articles, what tools, programs or how-to documents would you hope to find?
6. What 5G events, devlabs and/or hackathons if any would you hope to attend? What would make an event like this a success for you?



Sample 5G Titles and Content Outlines

1. Title: Definitive Guide to 5G Technology

- 5G Plans (Intro, coverage plans, device plans (half page)
- 5G Requirements Made Easy (below, four pages—add 2-3 more)
- What types of current use cases might benefit the most? (below 4 pages, plus more)
- Building business case for 5G

2. Title: Definitive Guide to 5G Technology

- Essential 5G development facts
- 5G Development Kit/How to get ready
- 5G Development Checklist
- 5G Application testing ARO/AT&T Video/Application/5G Optimizer

3. Title: Future of 5G

- Essential 5G development facts
- 5G Development Kit/How to get ready
- 5G Development