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Member driven. Technology focused.

Rural Broadband Operations Benchmarking Report

RESULTS AND INSIGHTS FROM A COMPREHENSIVE DATA GATHERING EXERCISE

February 2024

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Introduction

The Rural Broadband Operations Benchmarking Report

THE LATEST IN OUR BENCHMARKING SERIES

Previous benchmarking studies

In the last few years, we've published a series of benchmarking studies focused mostly on the benefits and costs of deploying **broadband** and **smart grid** technologies in collaboration with our national cooperative partners. These studies helped members evaluate and plan for these technologies.

The Rural Broadband Operations Benchmarking Report

As we spoke to members about these reports, they asked us for insight into the metrics related to broadband operations. This reports' goal is to **catalog our members' operational results and best practices that provide exceptional service for end-consumers**.

This report consists of eight main sections:

- Executive summary
- General and financial
- Marketing and Customer Experience
- Customer Service
- Installation and Repair
- Network Management
- Information Technology
- Challenges and Opportunities

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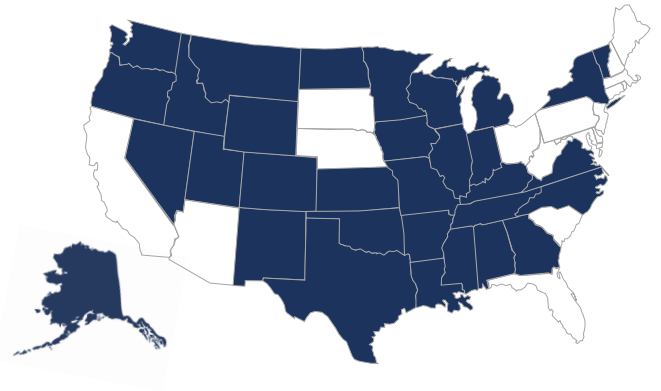
Survey population — our members

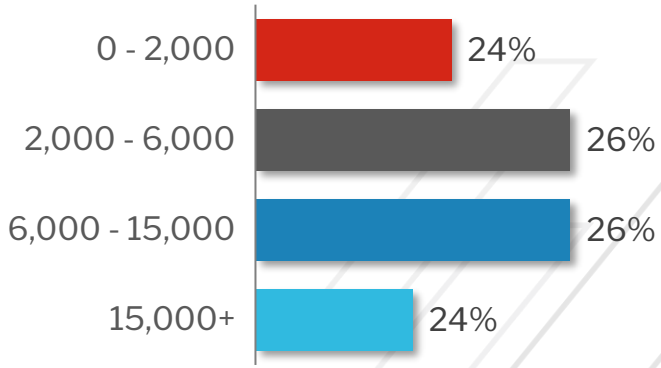
Survey participants were NRTC-member rural broadband providers

- Mix of **traditional telephone service** providers and **electric cooperatives** that have launched broadband
- **84 Members** from **33 states** with diverse characteristics
- Members of **various sizes**, representative of our membership as a whole
- Much smaller in scale than national operators, the median participant had about 6,100 subscribers
- Members with **various years in operation**, from new broadband providers to providers that have been in business for over 100 years
- As we will discuss in this report, our members are **extremely responsive** to their customers and provide **exceptional service**

Participants by geography



Participants by subscriber count



Executive summary

Exceptional service results in competitive differentiation and customer loyalty

Our members are **small but mighty**

Despite being a fraction of the size of the national operators …

6,100 customers

35 employees

Members provide great service …

74 sec Help Desk ASA

75% First call resolution

… resulting in exceptional loyalty

75 NPS

1% Churn

50% Take rate

However, **competition** is heating up

#1 challenge

Increased competition was cited most often as a concern

64%

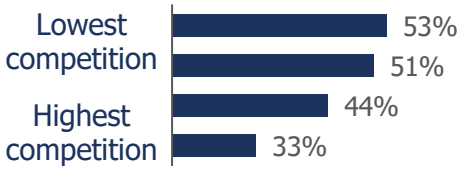
Have competition offering at least 100/20 in their footprint

#1 opportunity

Many respondents expanding geographically, often into competitive areas

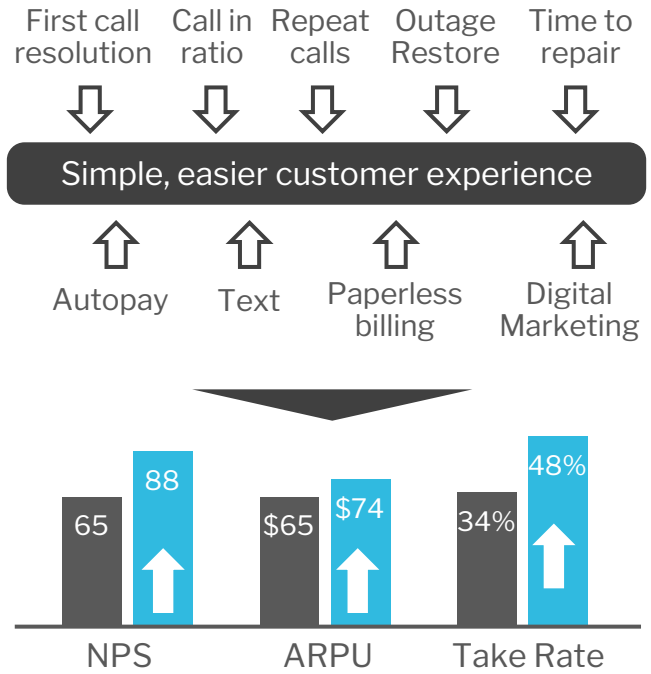
Correlation

Competition & take rate correlated



This report outlines **best practices to help you compete**

Better service & omni-channel support and communications correlate with customer loyalty and results

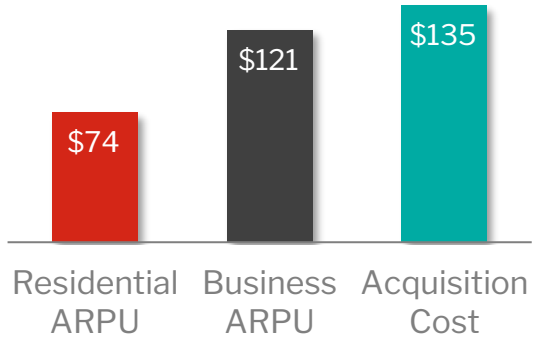


Business metrics summary

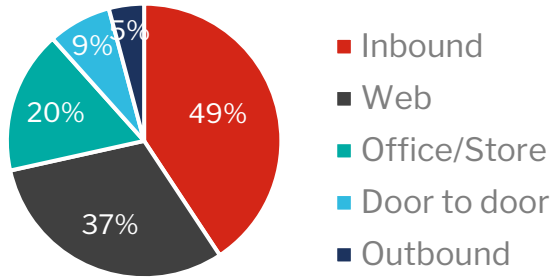
General

Locations passed	Revenue
13,590	$10.0M
Customers	**Operating Income**
6,115	$2.0M
Res. Take Rate	**Employees**
50%	35

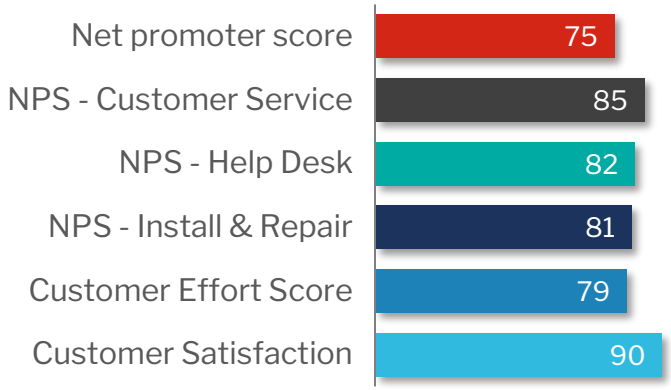
Customer Economics



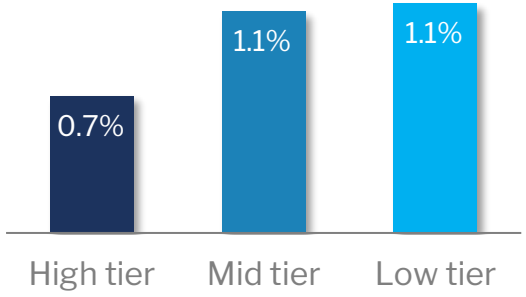
Sales Channel Distribution



Customer Experience



Churn by Speed Tier



Digital Marketing

SEM Conversion	Email Open Rate
10%	49%
SEM Cost per Click	**Click Through Rate**
$1.20	3%
SEM Cost/Conversion	**Email Conversion**
$19	2.6%

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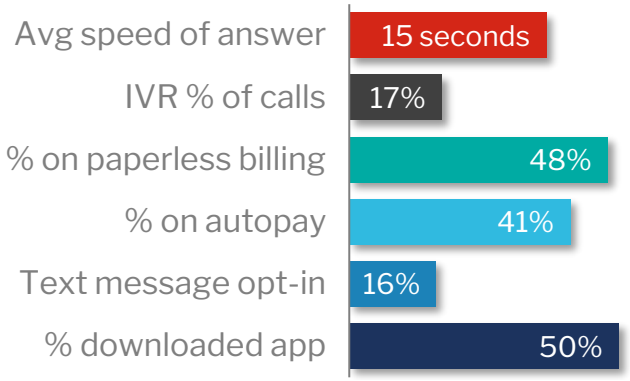
Note: Data represents the median for each metric over the previous 12 months

Customer Operations metrics summary

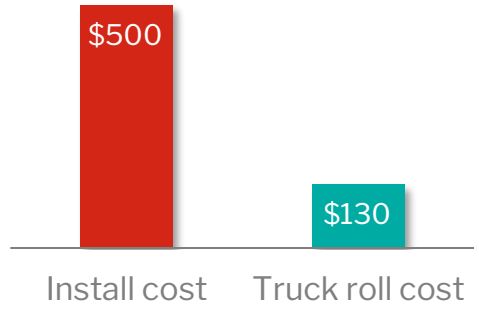
Customer Service



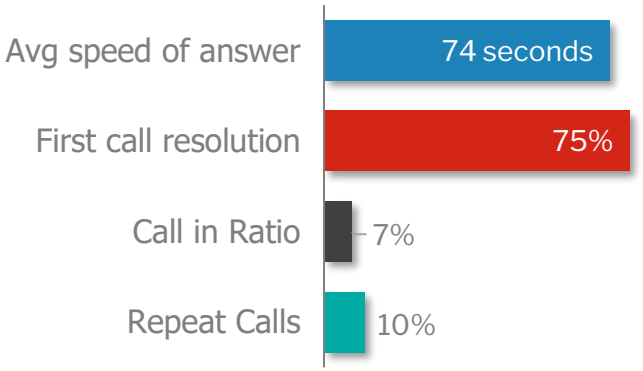
Installation and Repair

Days to install	Install time
6.5 days	2 hours
Time to repair	**Repair time**
2 hours	1 hour
Truck roll % of tickets	**Repeat troubles**
28%	5%

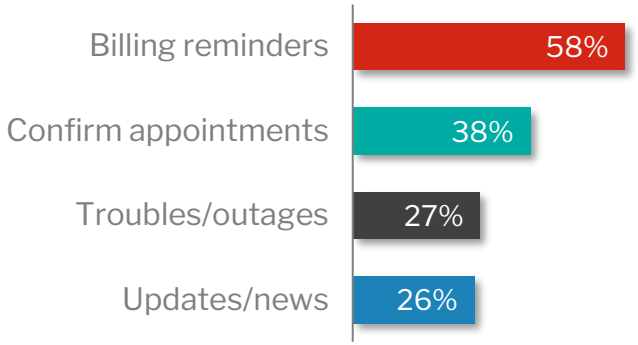
Installation and Repair Cost



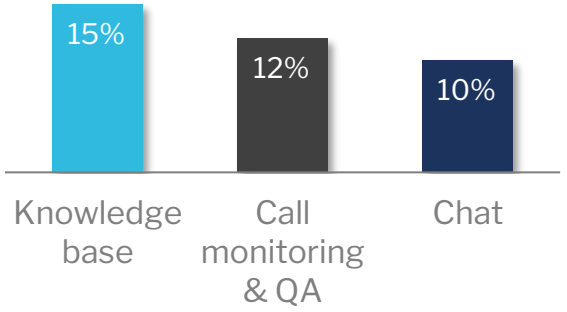
Help Desk



Use of Text Messaging



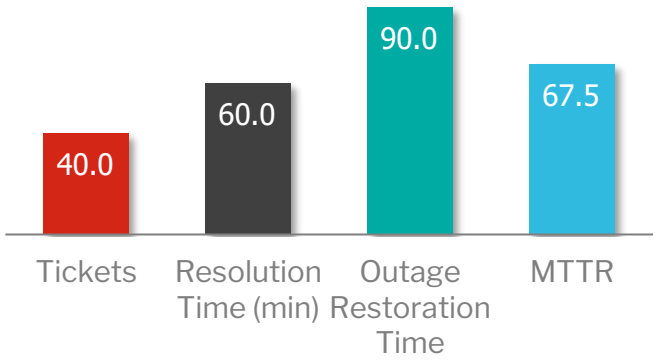
Use of AI



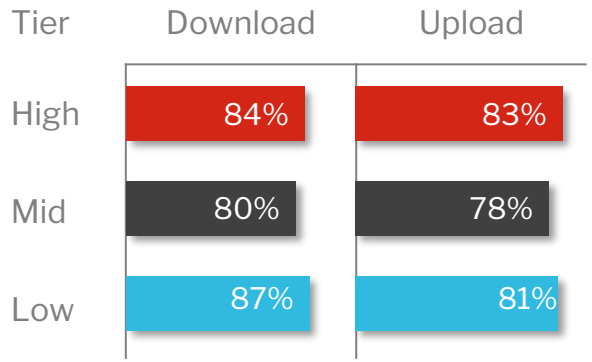
Note: Data represents the median for each metric over the previous 12 months

Network and IT metrics summary

Network Management



Actual Speeds % Purchased Speeds



Network Performance and Maintenance

Packet Loss
0.36%

Latency
9 milliseconds

Damaged Fiber Incidents
1.3 per month

Information Technology

Uptime
99.99%

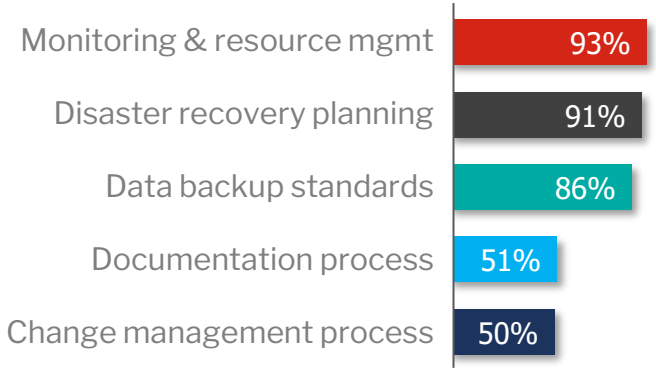
Documentation %
75%

Change Success Rate
95%

Recovery Time
4.5 hours

Recovery Time Objective Adherence
50%

Use of IT Procedures



Cybersecurity

Access Incidents
0.1 per year

Anomaly Detection
5%

Incident Response
30 min

System Recovery
6 hours

Cybersecurity Score
3.0

Personnel on staff
0

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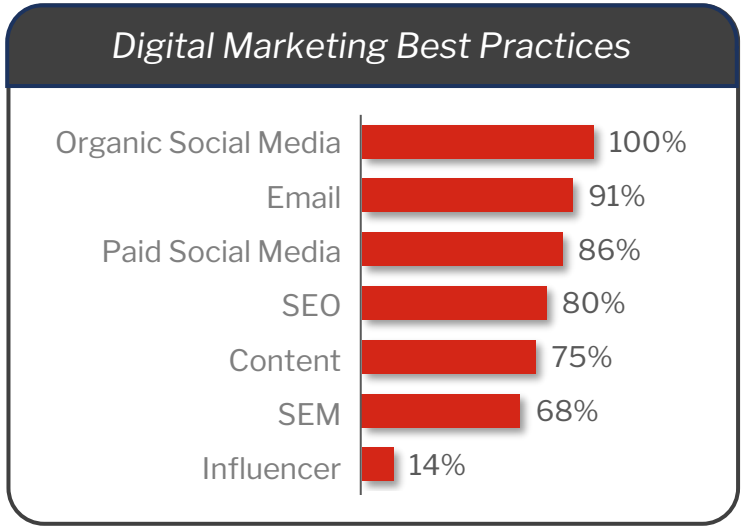
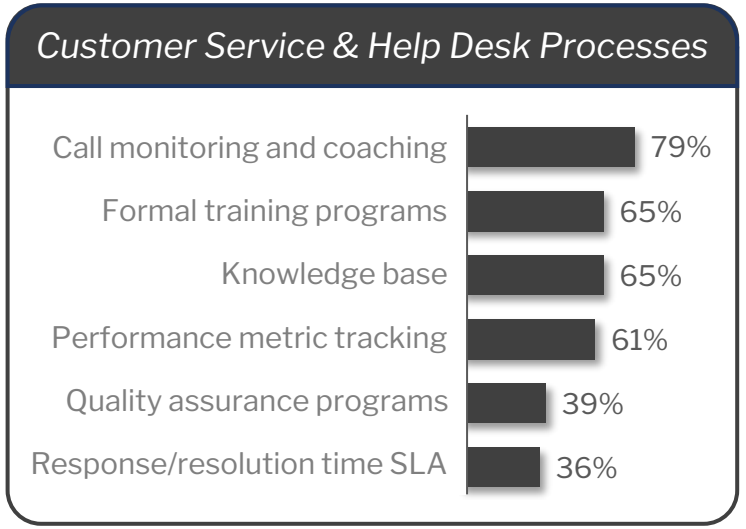
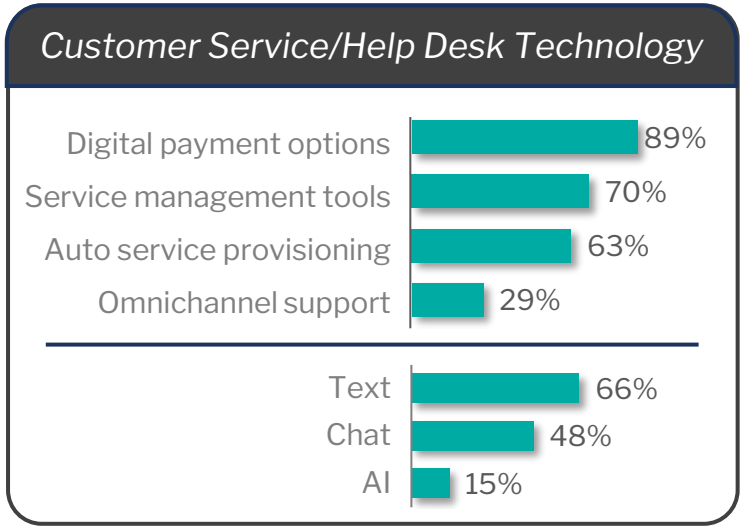
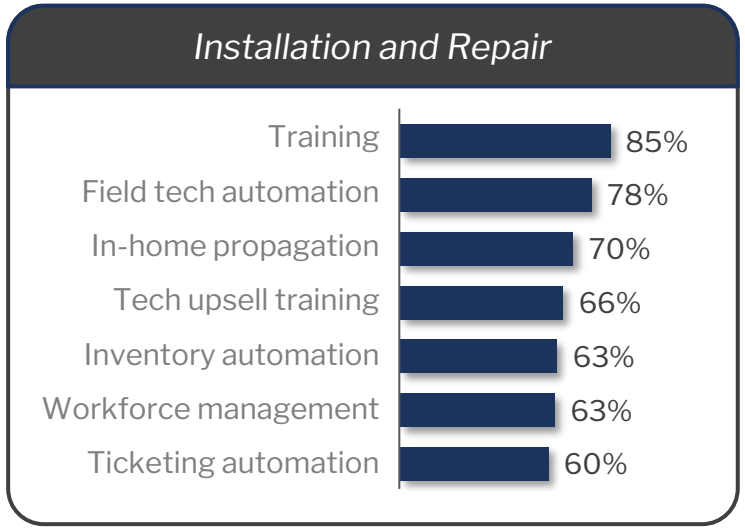
Note: Data represents the median for each metric over the previous 12 months

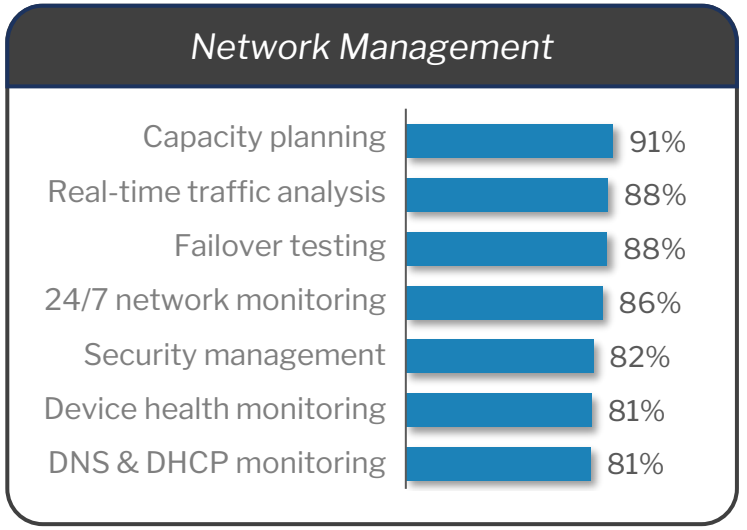
Best practice summary

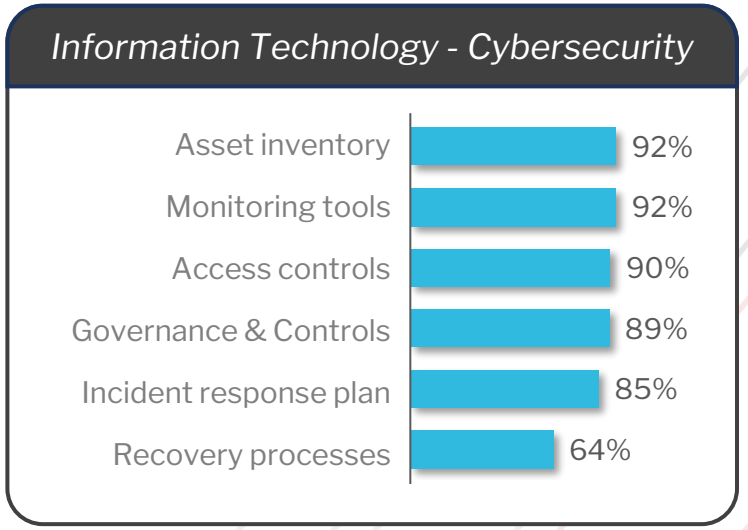












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Note: Represents % performing each best practice

General and financial

Box and whisker explanation

Box and whisker charts display deployment statistics and results

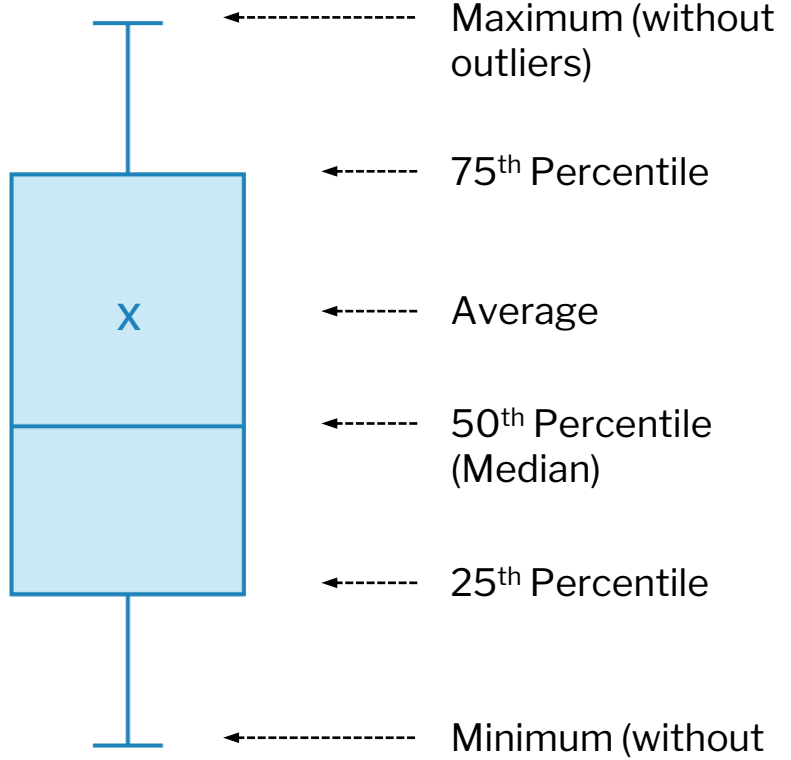
The size and nature of broadband provider operations vary depending on various factors that we will discuss. Therefore, benchmarking results require looking at more than just averages.

To display and explain results, we have used “box and whisker” charts. These allow us to:

- Show the range of results from minimum to maximum
- Show both the median and average results
- Show the most common results, as defined as the range of the 25th percentile to the 75th percentile

Note that we have excluded outlier results to make the charts easier to read.

Chart definition



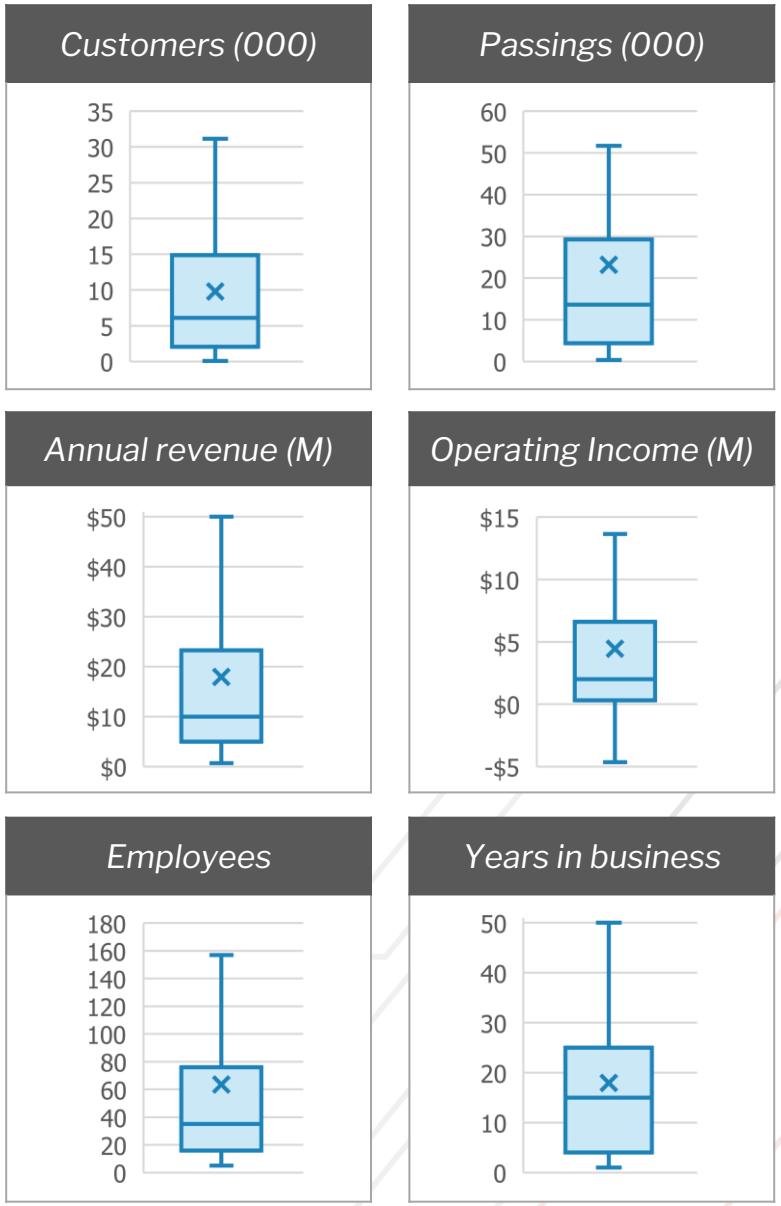
Territory & business characteristics

The characteristics of member networks vary widely:

- The **median characteristics** were:
  - $10M in annual revenue
  - 13,590 locations passed
  - 6,115 subscribers
  - 35 employees
  - 15 years in business
- The size of operations varied widely, ranging from 91 to 39,000 subscribers (note that we excluded outliers from the graphs)

In the context of the overall market, members serve a specific local market and operate at a fraction of the national operators' scale

- National operators have up to 30 million subscribers mostly located in urban and suburban areas; our members are less than 0.1% of that size
- This report outlines the service levels and operational metrics that our members achieve, and the resourcing models and best practices that they employ to achieve these results



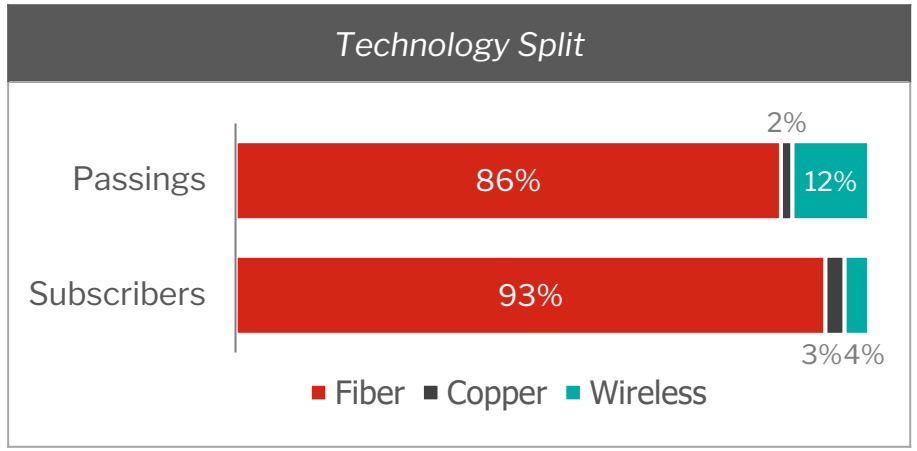
Access technologies

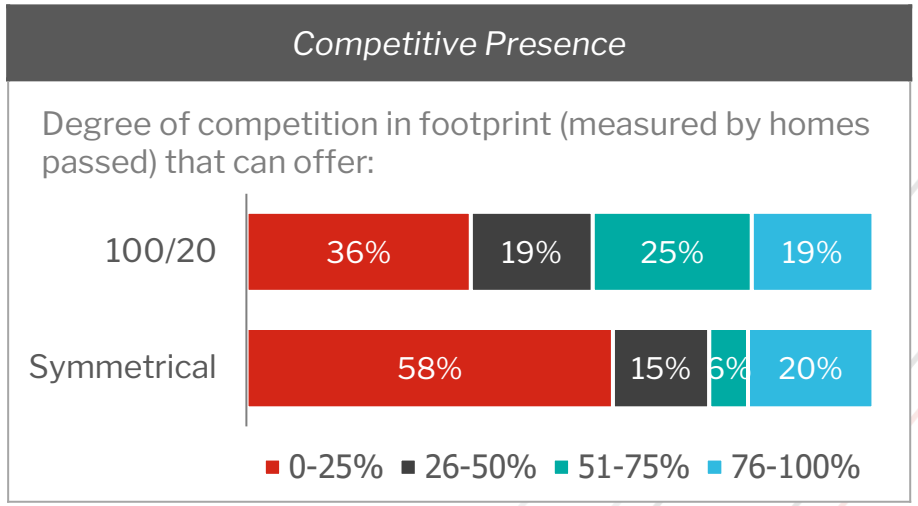
Members have deployed fiber to the vast majority of passings

- 86% of passings are fiber, with 12% wireless, and 2% copper
- 93% of subscribers are fiber; larger providers were more likely to have a higher percent of fiber passings

The competition offers broadband (defined as 100/20) in <50% of respondents' footprints and limited symmetrical speeds

- 55% of members see 100/20 competition in <50% of their footprint
- Only 26% see competitive symmetrical speeds in >50% of their footprint

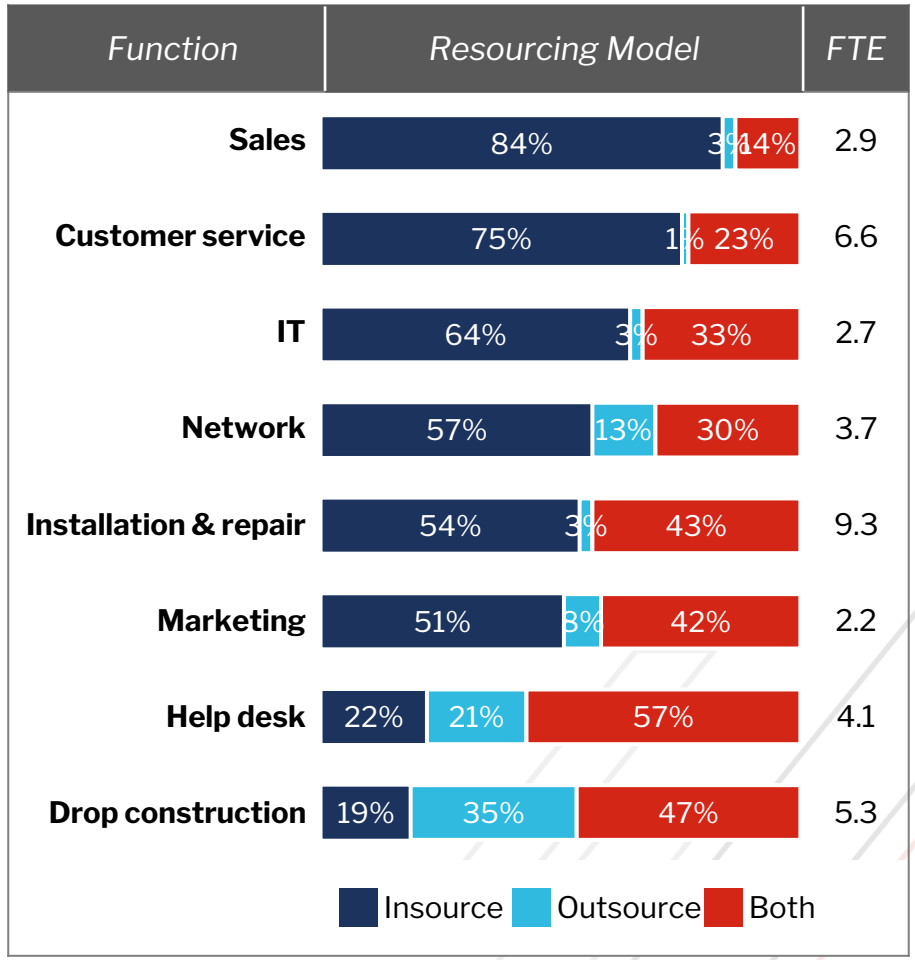




Resourcing

Members are using a combination of staffing models depending on their resources and operating preferences

- Members mostly insourced Sales, IT, and Customer Service
- Most members either outsourced or partially outsourced Drop Construction, Help Desk, and Installation and Repair
- Partially outsourcing occurs when members augment their staff with outsourced partners; for example, Help Desk on nights and weekends, or a marketing firm for branding, research, and content



Marketing and Customer Experience

Customer economics

Median customer economics:

- Residential ARPU: $74
- Churn: 0.9%
- Customer acquisition cost: $135
- Customer lifetime value (CLV): $5,005; this is a metric of customer value (profit) over the average subscriber lifetime

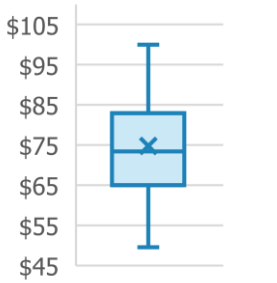
Many members track customers and churn by speed tier

- High-tier churn was the lowest, likely due to lack of competitive alternative services (i.e. symmetrical gigabit service)
- Churn was similar in the medium and low tiers

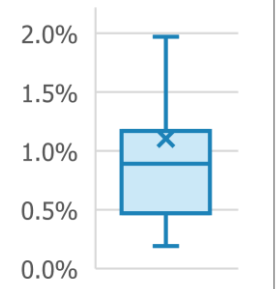
Most members offering internet and voice service

- Only 32% offering video service

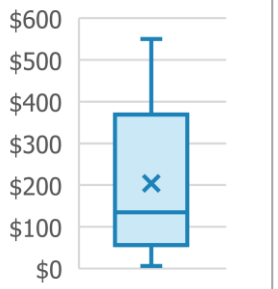
Residential ARPU



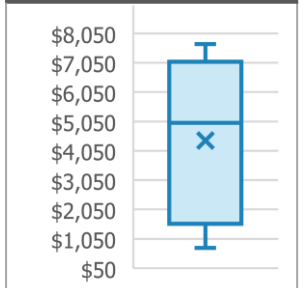
Churn



Customer acquisition cost

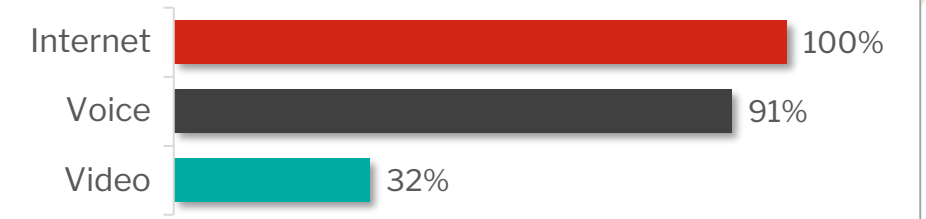


CLV



Res. speed tiers	*% customers*	*Churn*
Highest	23%	0.68%
Medium	29%	1.10%
Lowest	48%	1.14%

Services



Take rates and sales channels

Members seeing attractive take rates

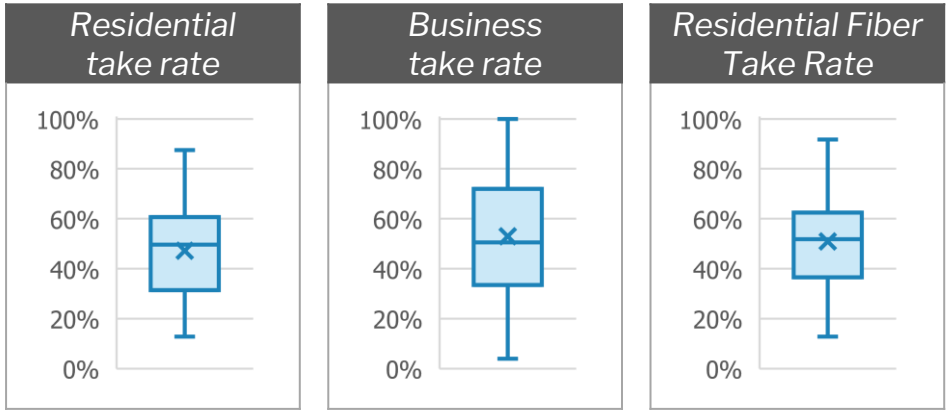
- Median residential take rate of 50%
- Median business take rate of 51%
- Median fiber take rate of 52%

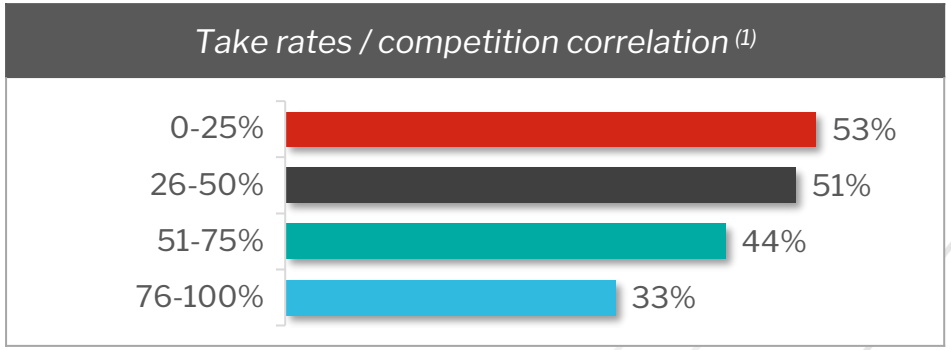
Take rate analysis and correlations

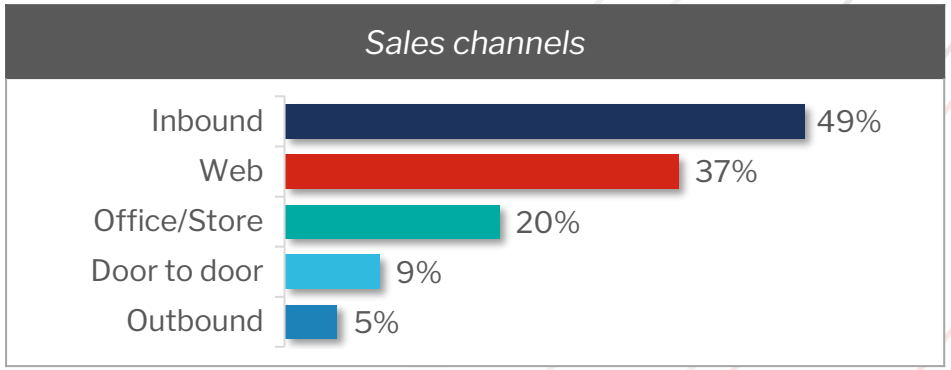
- Members in business for over 10 years have take rates of over 60%
- Areas with lower competition had higher take rates than those with higher competition

Inbound and web comprised over 75% of sales

- Most sales occurred in low-cost channels
- Very few outbound sales







(1) Competition ranges represent the % of the footprint with 100/20 competition

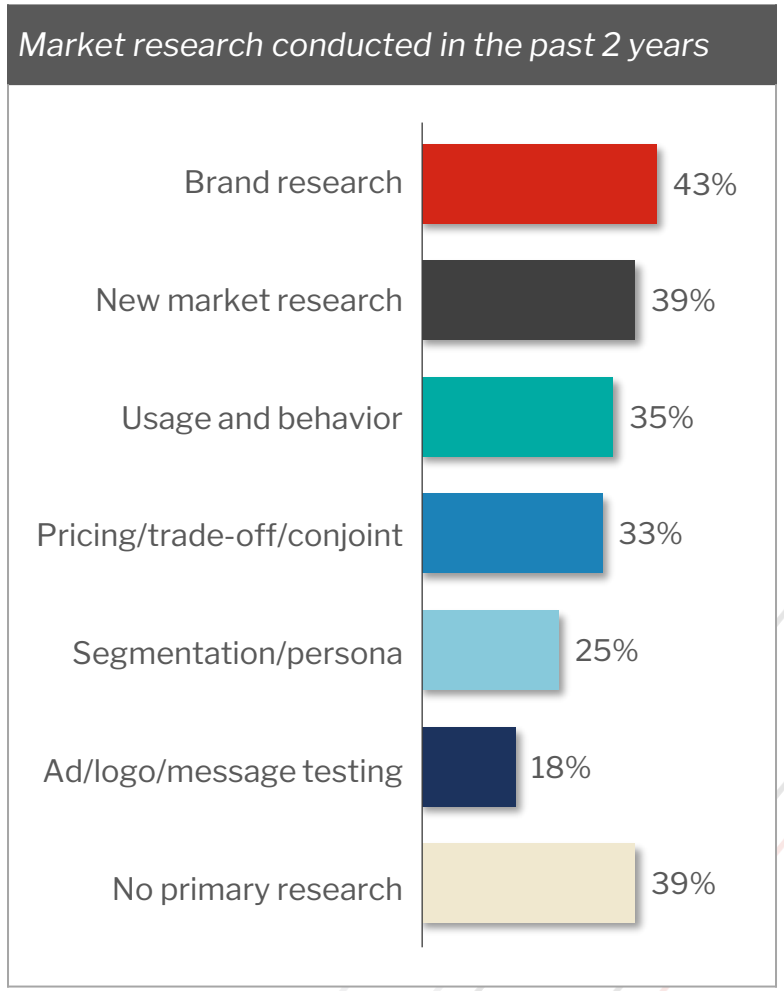
Marketing best practices: market research

Market research enhances customer understanding and targeting

- **Brand research** is used to determine brand perception, awareness, and sentiment based on insights from quantitative surveys and focus groups
- **New market research** helps identify potential demand in new markets using findings from quantitative surveys, one-on-one interviews, and focus groups
- **Usage and behavior trends** uncovers patterns in product usage and consumer behavior through quantitative surveys and in-depth interview feedback
- **Pricing/trade-off/conjoint** helps understand the value consumers place on features and willingness to pay, based on insights from surveys and focus groups
- **Segmentation or persona development** creates customer profiles based on data from surveys and focus groups, allowing for targeted marketing strategies
- **Ad/logo/message concept testing** assesses the effectiveness and appeal of marketing creatives by analyzing feedback from both surveys and focus groups

Members are using research for several purposes

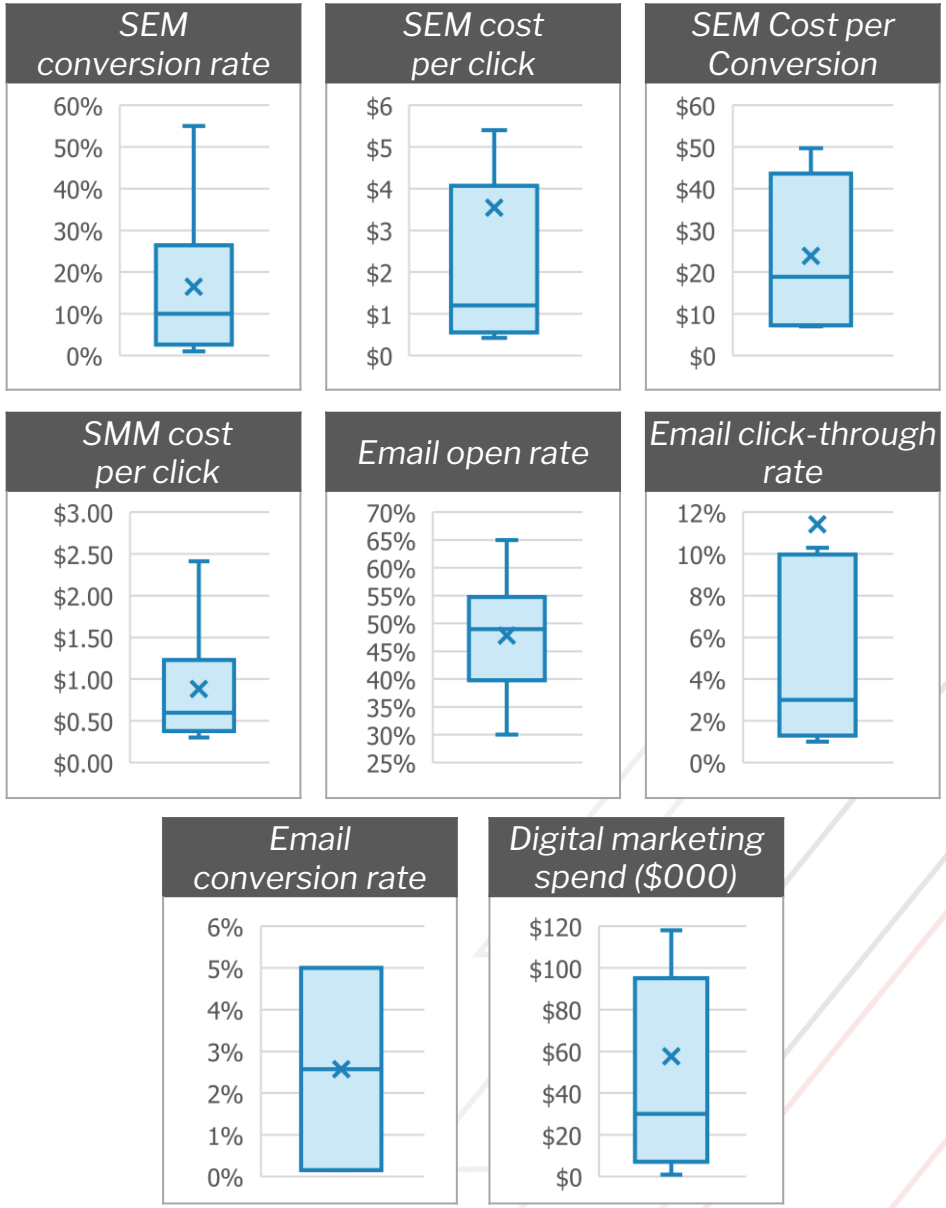
- 43% used research to aid in brand positioning
- 39% researched demand in new markets, as several members are expanding their coverage, often connected with federal and state grant programs
- Fewer members used research for marketing analysis and segmentation; these practices may be increasingly important as competition increases



Digital marketing metrics

Members are seeing strong results

- **SEM Conversion Rates**: Median of 10%; exceeding the industry average of 4.4% (1). However, this may be due to a large number of tracked conversions in varying levels of significance
- **SEM Cost per Conversion**: Median of $19 is much lower than the industry average of $56 (1)
- **SMM CPC**: Median of $0.60 is lower than industry averages. For example, the average Facebook CPC is $1.72 across all industries and $1.27 for the technology industry (2)
- **Email Open Rate**: Median of 49% which exceeds the telecom industry average of 39% (3). This variation is likely caused by audience segmentation, strong messages, and visually appealing graphics
- **Email Click-through Rate**: Median of 3% is lower than the industry average of 13% (3). Average respondent CTR was 11%, more in-line with averages



(1) https://www.wordstream.com/blog/ws/2019/08/19/conversion-rate-benchmarks
(2) https://www.wordstream.com/blog/ws/2017/02/28/facebook-advertising-benchmarks
(3) https://blog.hubspot.com/sales/average-email-open-rate-benchmark

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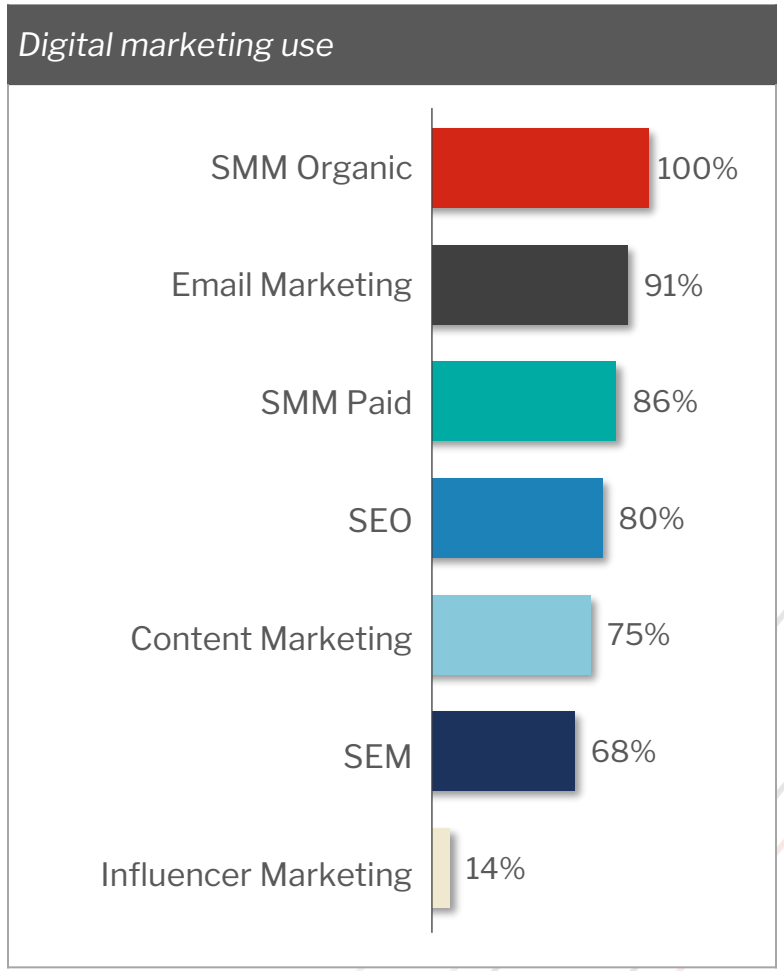
Digital marketing best practices

Use of digital marketing tactics

- **Organic social media marketing (SMM)** is a non-paid approach to engage and grow followers; for example, behind-the-scenes content on how fiber optics work
- **Email marketing** involves sending promotional emails to subscribers
- **Paid social media marketing (SMM)** uses paid advertisements on platforms like Facebook; for instance, an ad campaign highlighting ultra-fast internet speeds
- **Search engine optimization (SEO)** enhances a website's visibility in organic search engine results by optimizing content
- **Content marketing** creates content to attract and retain an audience, and to drive profitable customer actions such as infographics explaining speed tiers
- **Search engine marketing (SEM)** is a method of promoting services by using paid advertising to increase visibility in search engine results
- **Influencer marketing** involves collaborating with influential individuals, such as tech bloggers, to promote a product or service



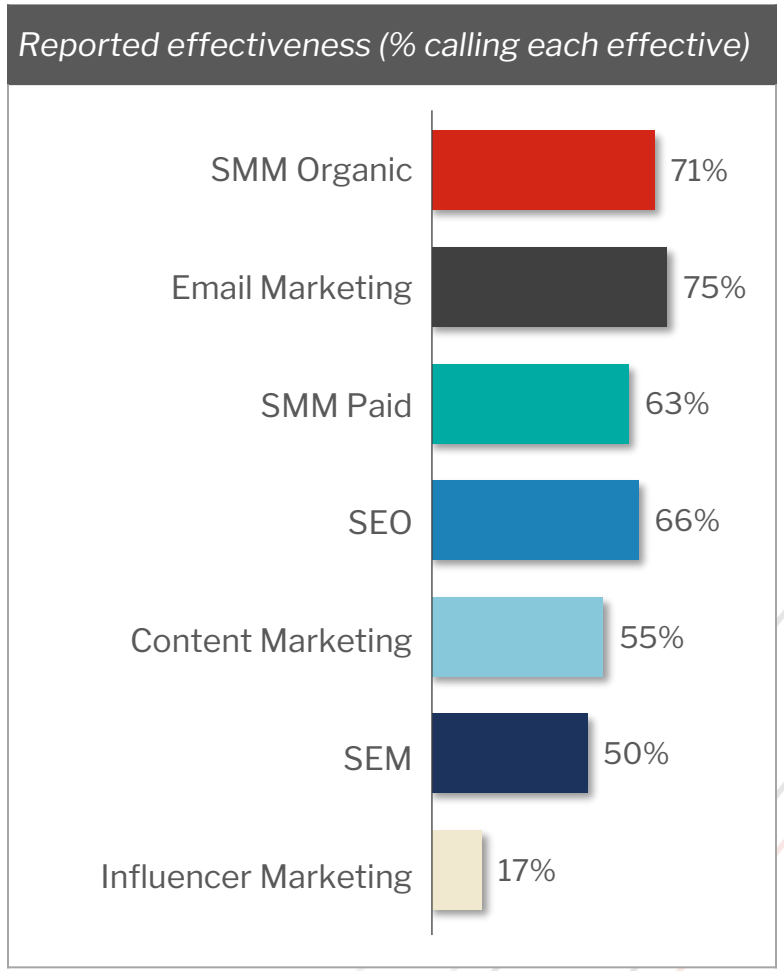
Digital marketing best practices

Reported effectiveness

- Members should use diverse marketing tactics spanning digital and traditional platforms to effectively reach their target audiences
- Despite widespread use of organic SMM, there is a notable underutilization of SEM, a strong conversion-driving tactic, in comparison
- This variance in strategy adoption may correlate with varying levels of perceived effectiveness across digital tactics
- While numerous digital KPIs could serve as success indicators, the primary focus for member companies should be on conversions

To enhance effectiveness and engagement in digital activities, marketing should adhere to key best practices:

- **Prioritize quality content**: Social media algorithms favor content that drives comments, emphasizing the importance of quality over quantity
- **Optimize each platform** for both organic and paid content
- Conduct **A/B testing in ads** to reach the target audience most effectively
- **SEO optimization**: Optimizing content for better search engine ranking
- **Dedicated landing pages** are critical for the success of digital campaigns. Always opt for dedicated landing pages over generic service pages



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Digital marketing best practices

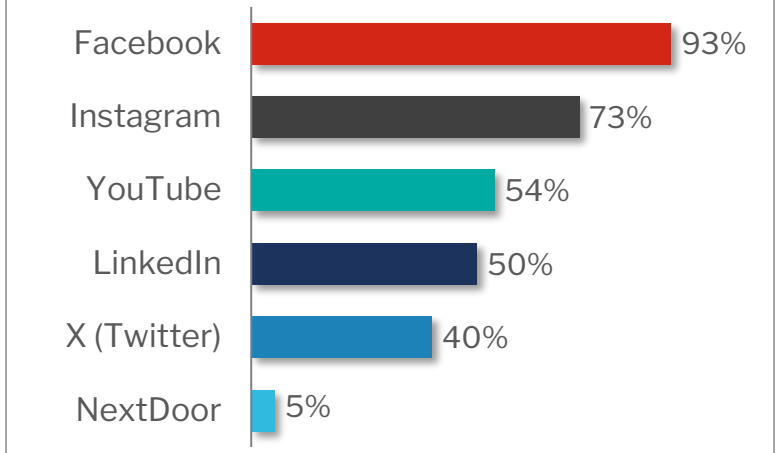
Social media

- Members most commonly advertise on Facebook and Instagram
- However, respondents reported mixed results
- Only Facebook was characterized by most respondents as effective

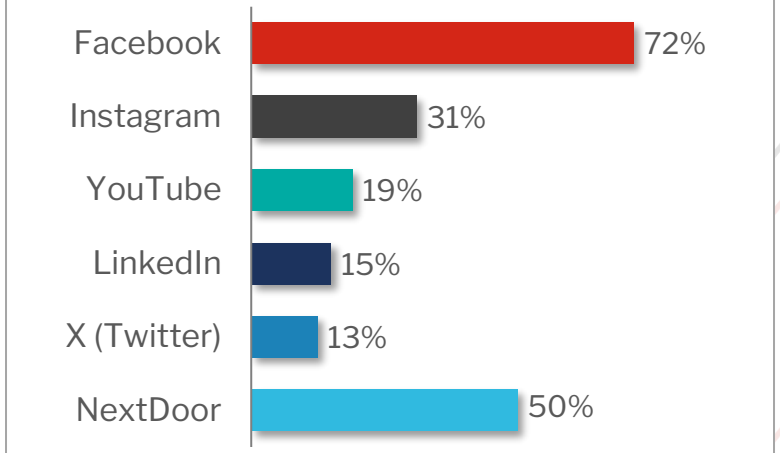
Given the dynamic nature of digital, members should closely monitor trends and adapt digital strategies accordingly

- This approach ensures ongoing effectiveness, strategic budget allocation, and ultimately, a positive impact on the bottom line
- Staying agile and responsive to the evolving digital environment is key to sustained success across the competitive digital landscape

Social media marketing use



Reported effectiveness (% calling each effective)



Customer experience metrics

Tracking loyalty metrics helps understand customer sentiment, informs business decisions, and enhances brand loyalty

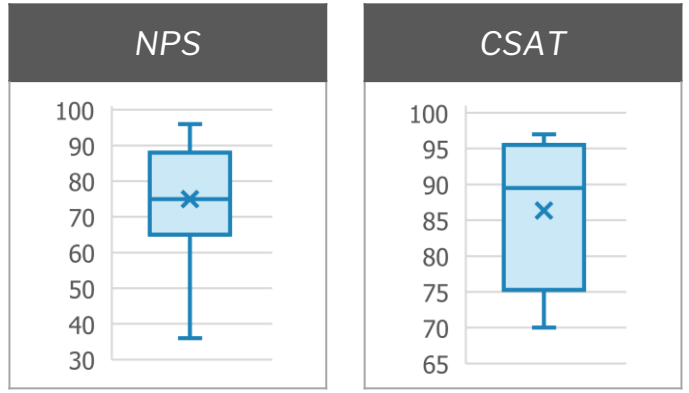
- **NPS (Net Promoter Score)** measures loyalty, typically measured as promoters (9-10 in 0-10 scale) less detractors (0-6)
- **Customer Satisfaction (CSAT)** evaluates satisfaction with a particular service or product, typically measured as top two of five boxes
- **Transactional NPS** measures loyalty after a specific interaction

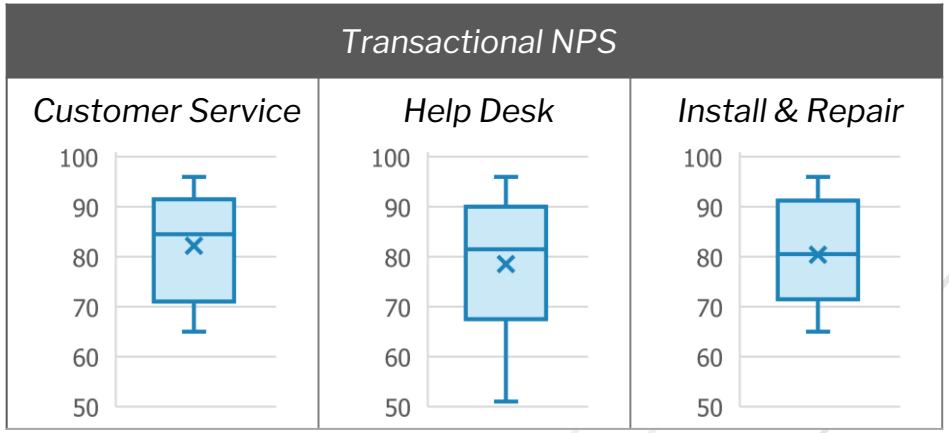
Respondent NPS is in the "excellent" category, reflecting very loyal customers, especially compared to national operators

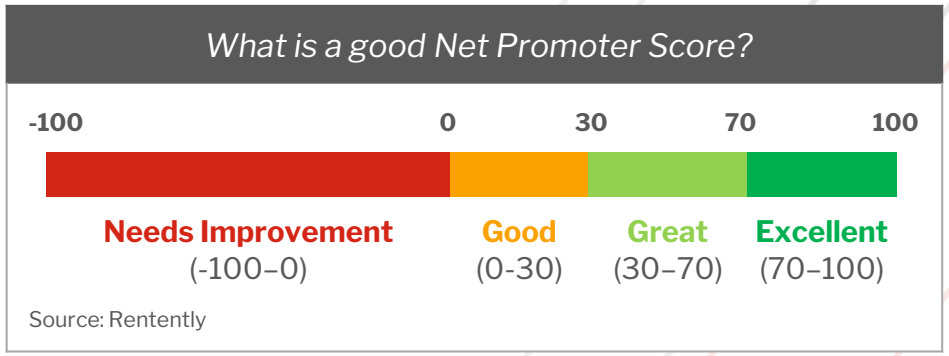
- Respondents' median NPS of 75 far exceeds the median Internet Service Provider NPS of -3 in the overall United States market (1)
- Transactional NPS was over 80; this is typically higher than overall NPS

Loyalty metrics are often used as a part of Customer Experience (Cx) programs that use customer feedback to optimize the Cx and measure the success of Cx initiatives; These include:

- Voice of the customer feedback loops
- Product, People, and Process improvement initiatives
- Using metrics to measure success of Cx initiatives







(1) https://www.retently.com/blog/good-net-promoter-score/

Correlations

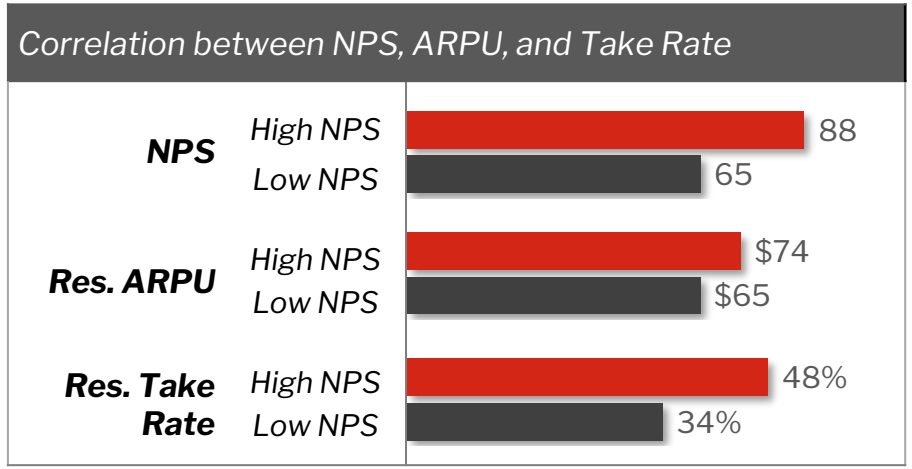
Good service results in customer loyalty, which in turn results in better business results

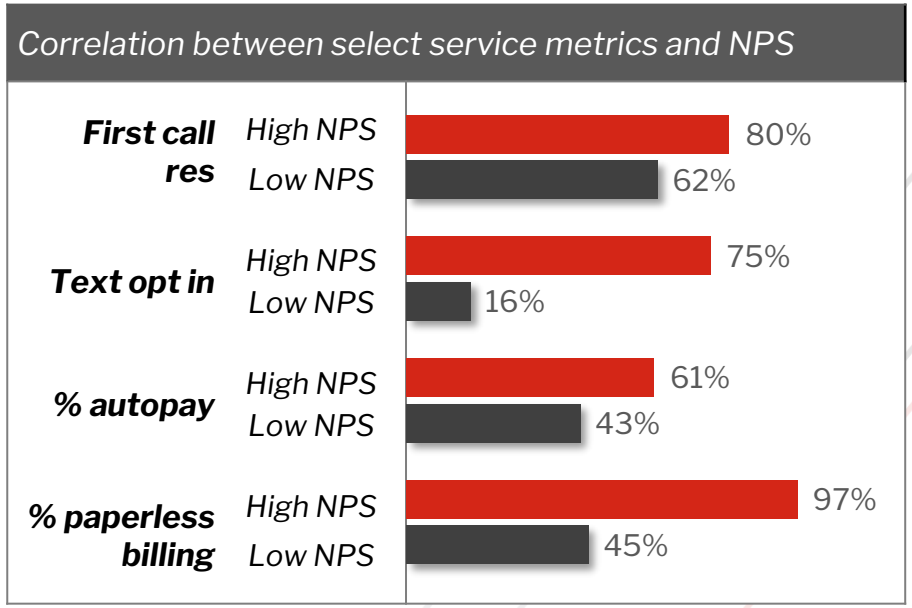
Customer loyalty leads to better business results

- We saw a correlation between reported Net Promoter Score and key success metrics such as Take Rate and ARPU

Good customer service and ease of doing business leads to loyalty

- We also saw a correlation between key service metrics and use of flexible communications and payment options and NPS
- In addition to the metrics shown on the chart on the right, those with higher NPS also overperformed on metrics such as call-in ratio and repeat calls





Customer service

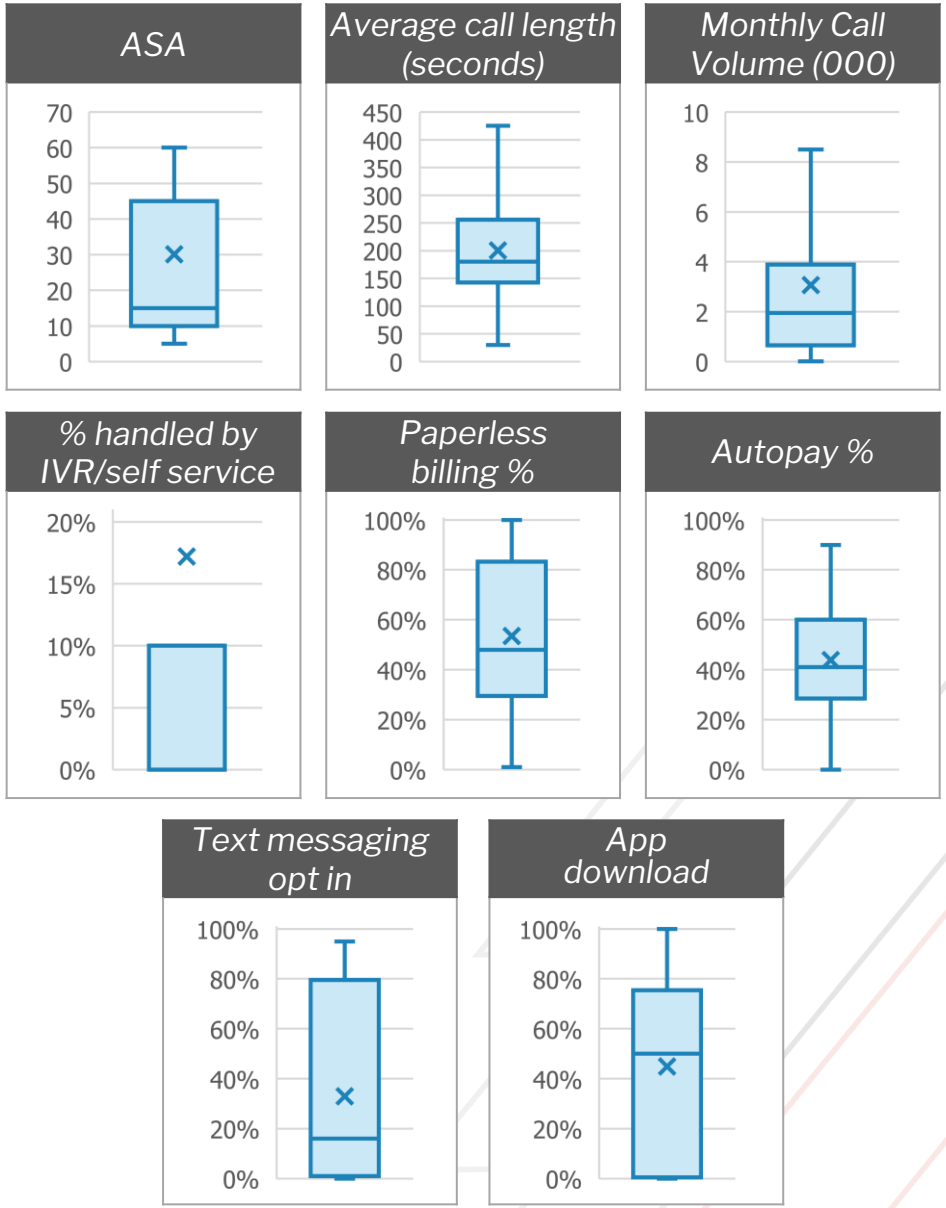
Customer service metrics

Metrics used to gauge customer service performance

- **Average speed of answer (ASA)** and **average call length**
- **Call-in ratio** is the average number of calls per subscriber per month
- **% handled by IVR/self service** is the percentage of customer issues that are resolved without speaking with a live agent
- **Paperless billing and autopay percentages** are the percentage of the subscribers opting for service options that are both customer friendly and result in operational efficiencies
- Also, increasing the percent of **customers opting into text messaging and/or downloading the provider app** can result in efficient ways to notify members of service outages, promotions, account management and troubleshooting

Results

- Members manage to an aggressive ASA to optimize the customer experience and differentiate against competitors
- Increasing customer awareness and adoption of paperless billing and autoplay promote operational efficiencies
- Increasing use of App and text messaging also presents an opportunity to enhance communications with customers



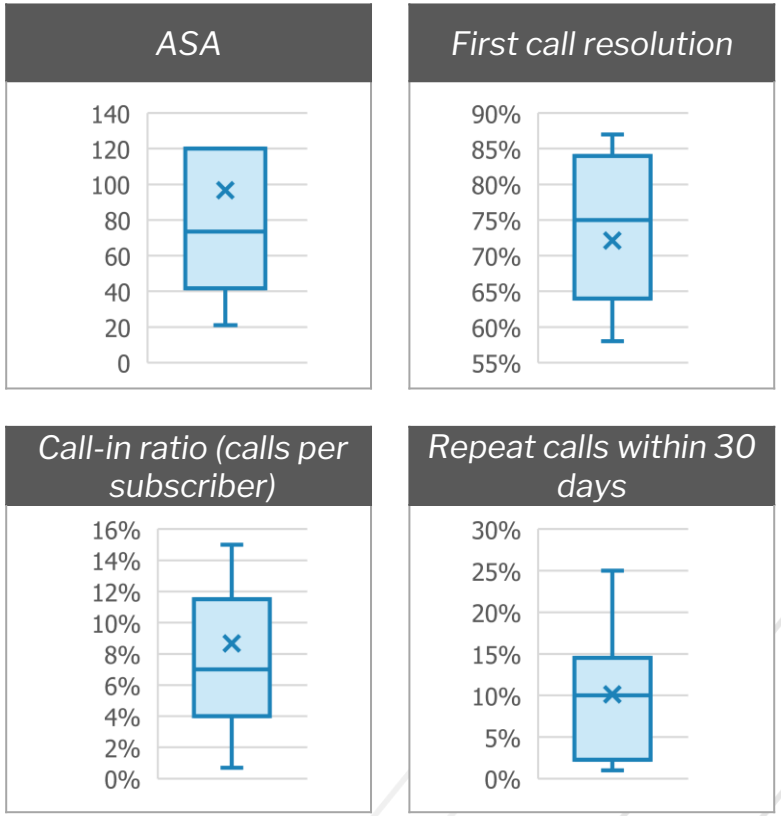
Help desk metrics

Metrics used to gauge help desk performance

- **Average speed of answer (ASA)** and first call resolution
- **Call-in ratio** is the average number of help desk-related calls made by each subscriber per month
- **Repeat calls** within 30 days helps inform about the number of customers experiencing repetitive issues and possibly training opportunities on how to avoid repeat issues

Results

- ASA for help-desk higher than Customer Service; this is typical because talk time for help-desk is usually longer
- Call-in ratios vary from member to member, variances often are driven by the type of broadband network



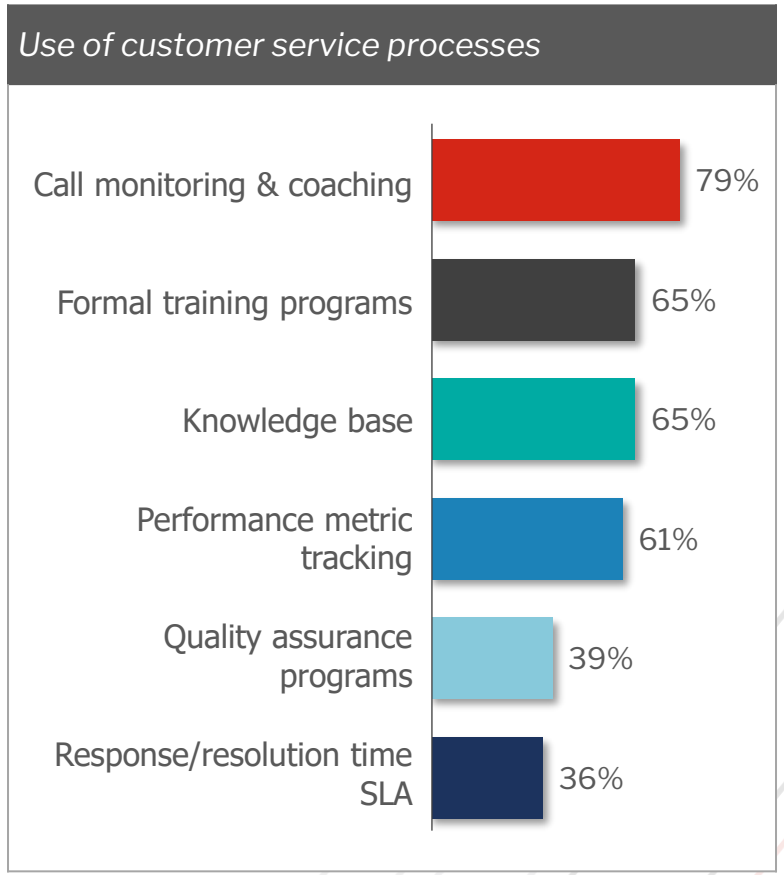
Best practices:
Customer Service & Help Desk processes

Processes used to enhance performance

- **Call monitoring and coaching** to identify areas for improvement and feedback
- Formal **onboarding** and ongoing **training** programs
- **Knowledge base** that agents can access to provide accurate information such as a FAQs, troubleshooting guides, and product specifics
- Track **key performance metrics** to measure call center effectiveness, identify trends, and make data-driven decisions for process improvements
- **Quality assurance programs** that evaluate agent performance to ensure consistent quality, including call audits, reviewing calls and providing feedback
- **Response and resolution time service level agreements** such as responding to customer inquiries in 24 hours and resolving issues within one business day

Results

- Most members are actively engaging in call monitoring and coaching but many lack a structured quality program
- Good utilization of metrics by members to monitor performance and identify opportunities, reinforcing that data is critical and having access is vital
- It is important to ensure that internal and external knowledge bases are synced
- The need for knowledge bases and training will increase as finding skilled labor to handle increasingly complex technologies becomes more difficult



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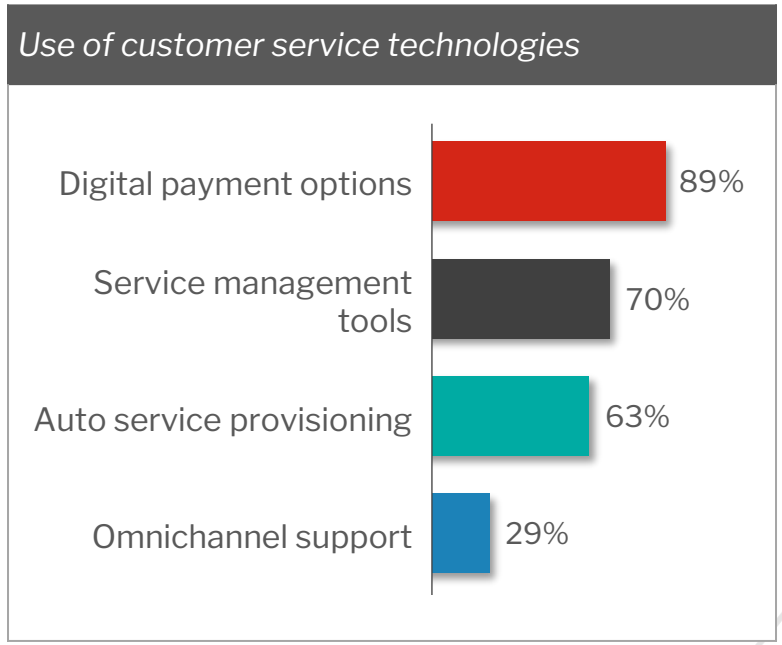
Best practices:
Customer Service & Help Desk technologies

Technologies used to enhance performance

- **Digital payment options** such as mobile apps, online portals, and automatic billing
- **Service management tools** that improve efficiency such as automated ticket routing and prioritization of customer issues based on severity
- **Auto service provisioning** to provision services quickly and efficiently
- **Omnichannel support** including phone, chat, email, and social media

Results

- Nearly all members today leverage some sort of digital payment option to offer the customer many options and make it easy
- More than half of members are leveraging some sort of automation to help drive operational efficiencies
- Phone continues to be the most dominant form of customer support with some use of chat and email
- Many members recognize the need to pursue social media as an option but actual use to date has been limited



Emerging best practices:
Use of text, chat, and AI

Members are using text messaging as an easy way to contact customers

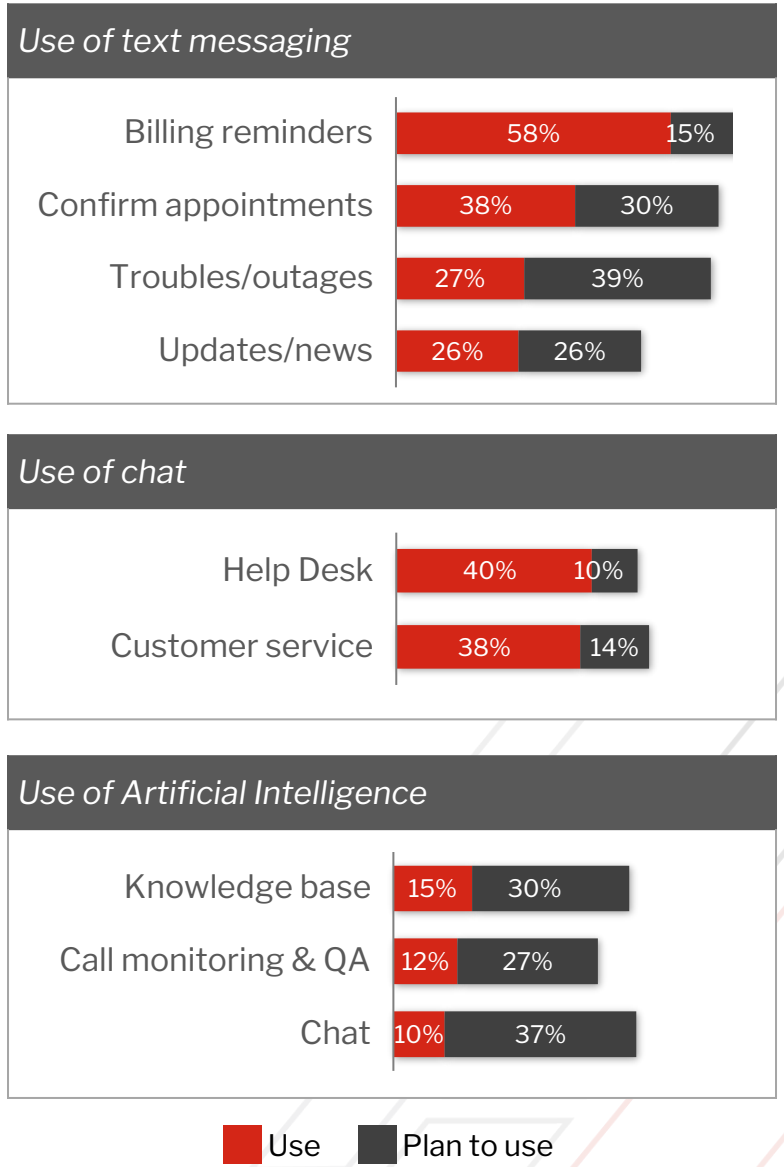
- Most are using text for billing reminders and appointments
- Many members are planning to use text for outage and trouble tickets

Use of chat for customer service and help desk support has some adoption but also opportunities as well

- About 40% of members are using chat for customer service and help desk
- Opportunity for members to add chat functionality to their websites to offer another means for customers to easily reach them

Artificial Intelligence is garnering a lot of attention

- Many members are planning to use AI for operational efficiencies
- In addition to efficiencies, AI can help to simplify processes and improve quality



Installation and repair

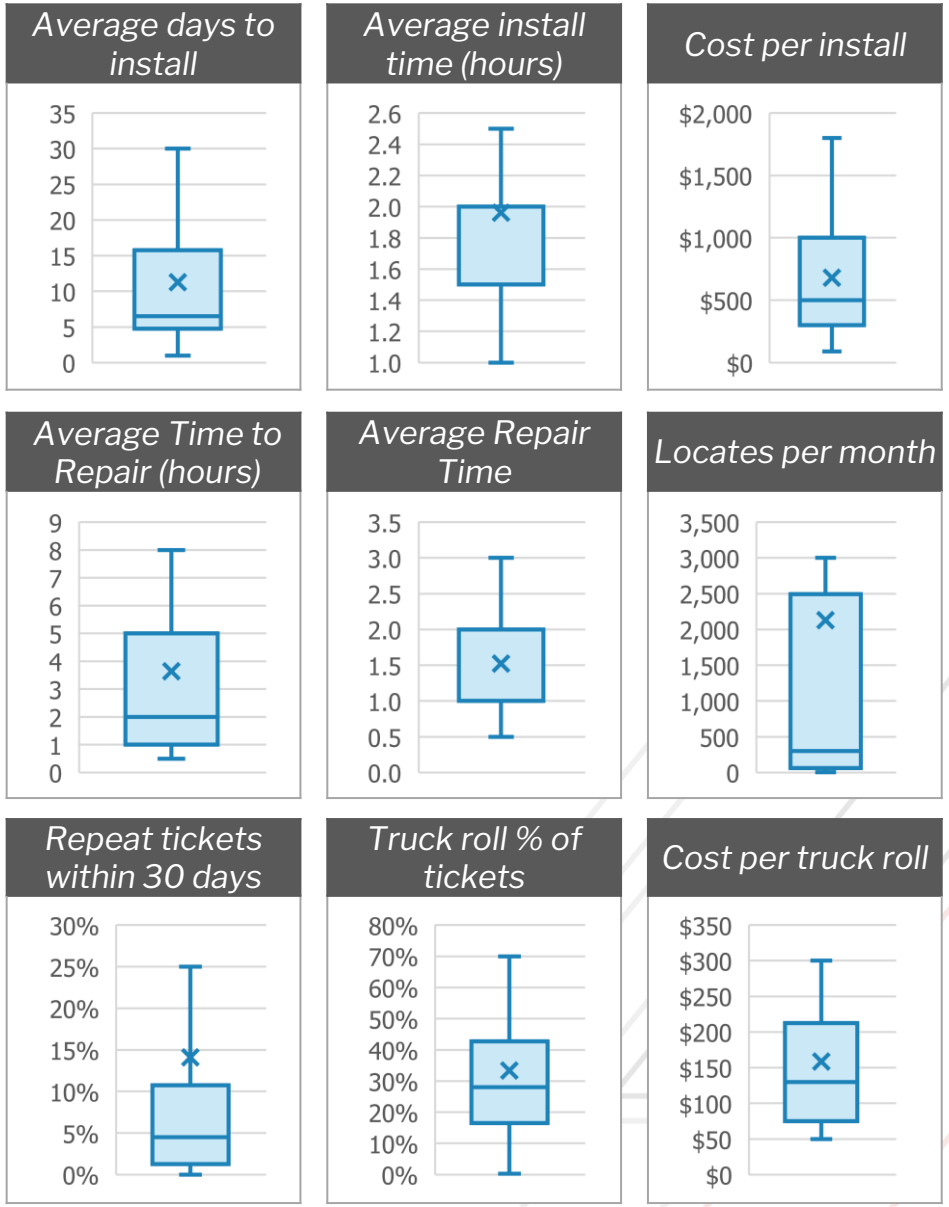
Installation and repair metrics

Metrics used to gauge installation and repair performance

- **Days to install** and **time to repair** measure the average duration to schedule and complete a service
- **Install time** and **repair time** measure the length of the service itself once at the customer premise
- **Locates** are the instances when technicians must locate, identify, and mark underground infrastructure for repair
- **Cuts** are the of instances where the broadband infrastructure is physically damaged or cut
- **Repeat tickets** are customers submitting multiple service requests for the same issue, indicating persistent problems
- **Truck rolls** are visits to the customer location

Results

- Median days to install was 6.5, but varied considerably with the 25-75th percentile ranging from 5 to 15 days
- Median install cost was $500; this also varied widely, likely due to differences in equipment and density
- Median time to install was two hours
- Median truck roll % of tickets was 28% with a median cost of $130



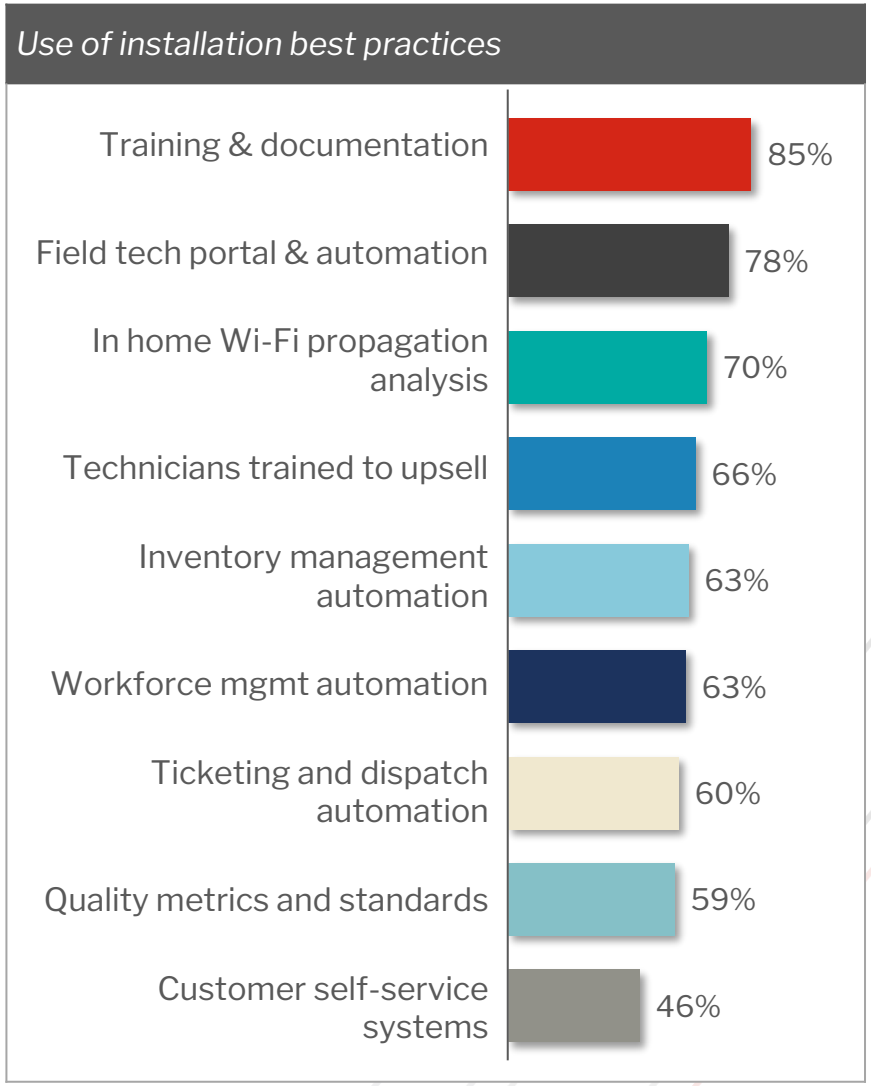
Installation & repair best practices

Processes and technologies to optimize installation and repair

- **Training and documentation** to equip teams with knowledge resources
- **Field tech portal and automation** provides technicians with real-time customer data and the ability to make changes at the customer location
- In-home **WiFi propagation analysis** that optimizes home WiFi coverage using tools that visually map signal strength throughout a home
- Training & incentivizing staff to recognize and convert **upsell** opportunities
- **Inventory management automation** to track equipment and supplies
- **Scheduling and workforce management** automation to streamline staff schedules and assignments, such as using AI to predict peak times
- **Ticketing & dispatch automation** for service requests & tech dispatch
- **Quality metrics and standards** to track performance against goals
- **Self-service tools** that enable customers to resolve issues independently

Many members are automating install and repair processes

- Most are training field techs and providing a portal and automation
- Opportunity to deploy workforce management and dispatch automation
- Volume drives this decision; respondents with more subs than the median were about twice as likely to have deployed workforce management



Network management

Network management metrics

Metrics used to track network management performance

- **Resolution Time** is the time to resolve and close tickets
- **Restoration Time** is the time to restore service after outages
- **Mean Time to Repair (MTTR)** is the time it takes to restore services after a reported issue
- **Damaged Fiber Incidents** are the number of incidents where the fiber infrastructure is damaged or compromised
- **Packet loss** is the percent of data packets lost in transmission
- **Latency** is the time for data to travel from its source to its destination
- **Actual vs. Purchased Speeds** compares actual speeds during peak hours compared to what customers purchased

Results

- Median resolution time was 60 minutes with 75-minute outage restoration time
- Very low average latency of 9 milliseconds, as fiber represents the great majority of connections
- Members are delivering on their speed promises, with actual speeds approaching purchased speeds even during the peak busy hour

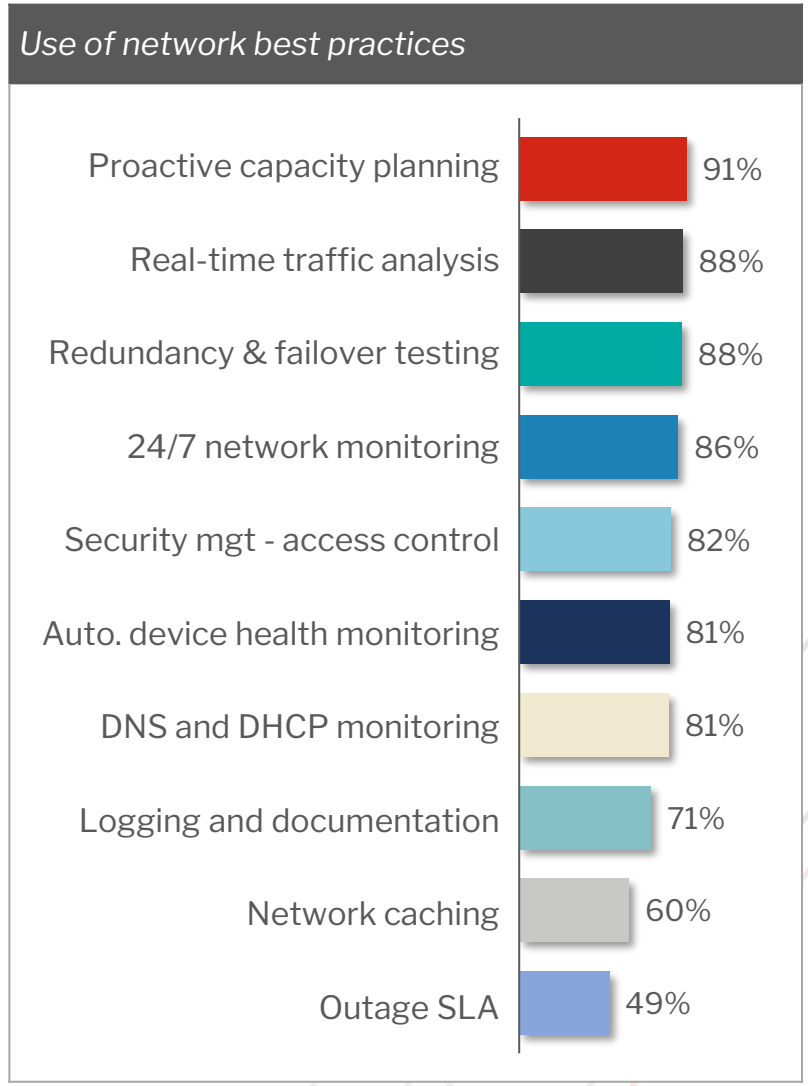
Network management best practices

Processes and technologies to optimize network management

- **Proactive capacity planning** to meet demand and prevent congestion
- **Real-time traffic analysis** to assess usage to adjust bandwidth allocation
- **Redundancy and failover testing** of backup servers during downtimes
- **24x7 network monitoring** of network health
- **Security management** to regulate access, i.e., multi-factor authentication
- **Automated device health monitoring** to provide a continuous view of status and issues; i.e., when a router's performance drops below thresholds
- **DNS and DHCP monitoring** that tracks and manages domain and IP services, i.e., detecting unusual levels of DNS queries indicating threats
- **Formal logging & documentation** to provide detailed activity records
- **Network caching** to store frequently accessed data closer to end-users to save transport cost and decrease latency
- **Outage SLA** tracks the adherence to SLAs for resolution

Members performing best practices, often via an outsourced partner

- Caching ranked near the bottom; this is driven by volume of transport cost savings – 82% of respondents with over 15,000 subs cache some traffic
- Only half of members have outage SLAs; this may also be driven by scale – 73% of respondents with over 15,000 have instituted outage SLAs



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Information technology

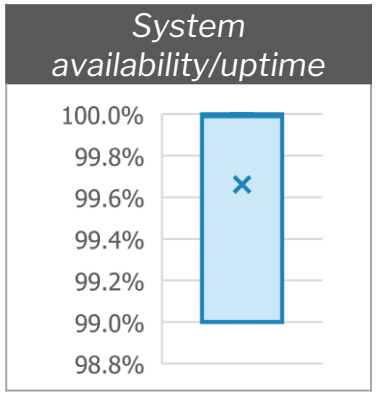
Information technology metrics

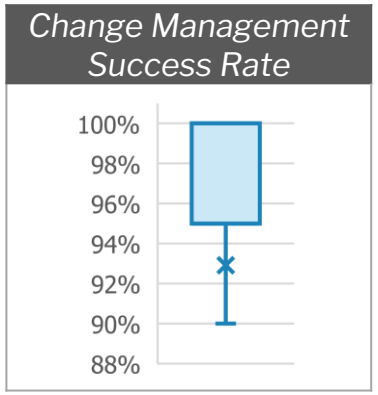
Metrics used to track IT performance

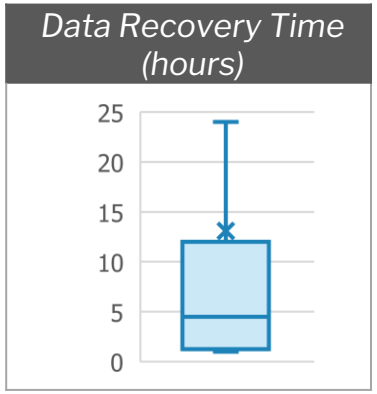
- **Availability/uptime** is the percent of time that a system is operational
- **Change management success rate** evaluates the success of implemented changes in operational processes service disruption
- **Data recovery time** is the time required to restore data after a failure
- **Recovery time objective adherence** measures performance against recovery time objectives
- **Documentation completion percentage** measures completed documentation against planned documentation tasks

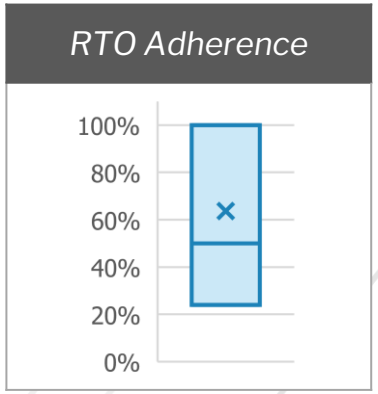
Results

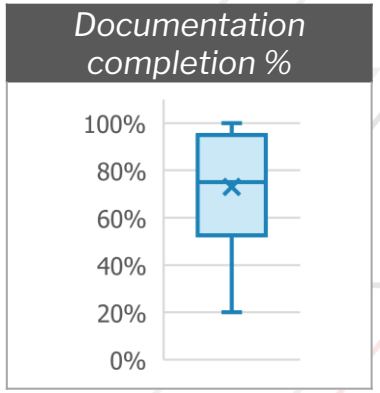
- Median uptime was 99.99%; The 25-75th percentile ranged from 99.0% to 99.999%, reflecting the number of “9s” that IT staff targets
- Median data recover time of 4.5 hours
- Members have a document completion percentage of 75%
- Opportunity to improve RTO adherence, with a median of 50%











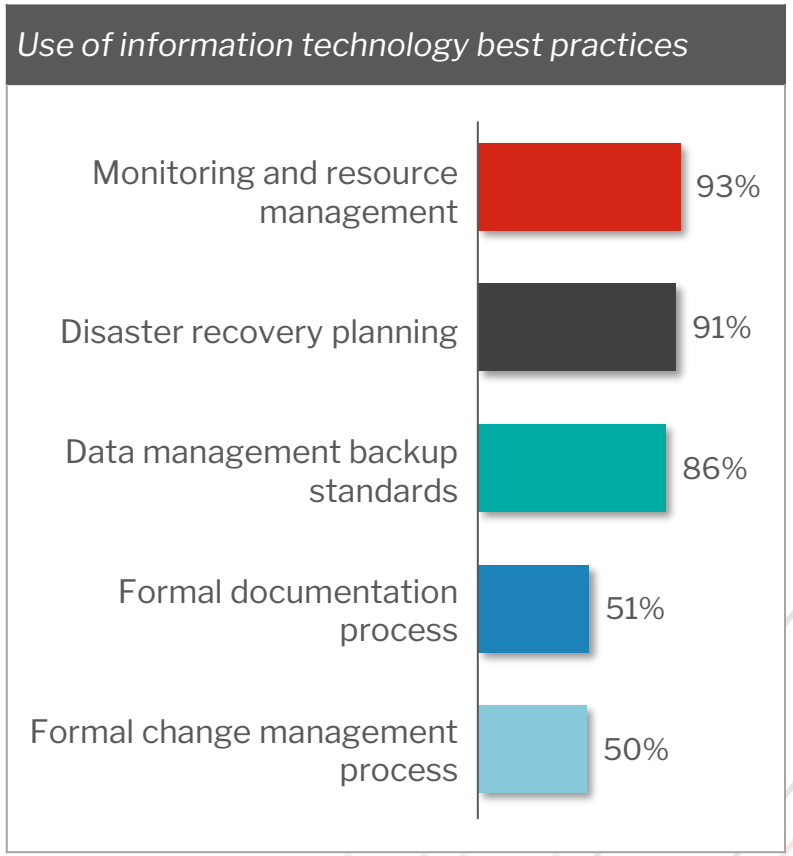
Information technology best practices

Processes used to optimize IT performance

- **Monitoring and resource management** uses proactive tools to optimize IT system performance, enhance security, and allocate resources efficiently
- **Disaster recovery planning** minimizes downtime and data loss in the event of IT system failures, natural disasters, or other emergencies
- **Data management backup standards and procedures** safeguard critical data, enabling quick recovery in case of data loss or system failures
- **Formal documentation processes** record IT systems, configurations, and procedures to ensure consistency and clarity in managing resources
- **Formal change management process** to assess, approve, and track modifications to systems, minimizing the risk of disruptions and breaches

Results

- Most members are monitoring their networks, planning for disaster recovery and backing up their data
- Opportunity for more to formally document their processes and institute formal change management processes to enhance operational resilience



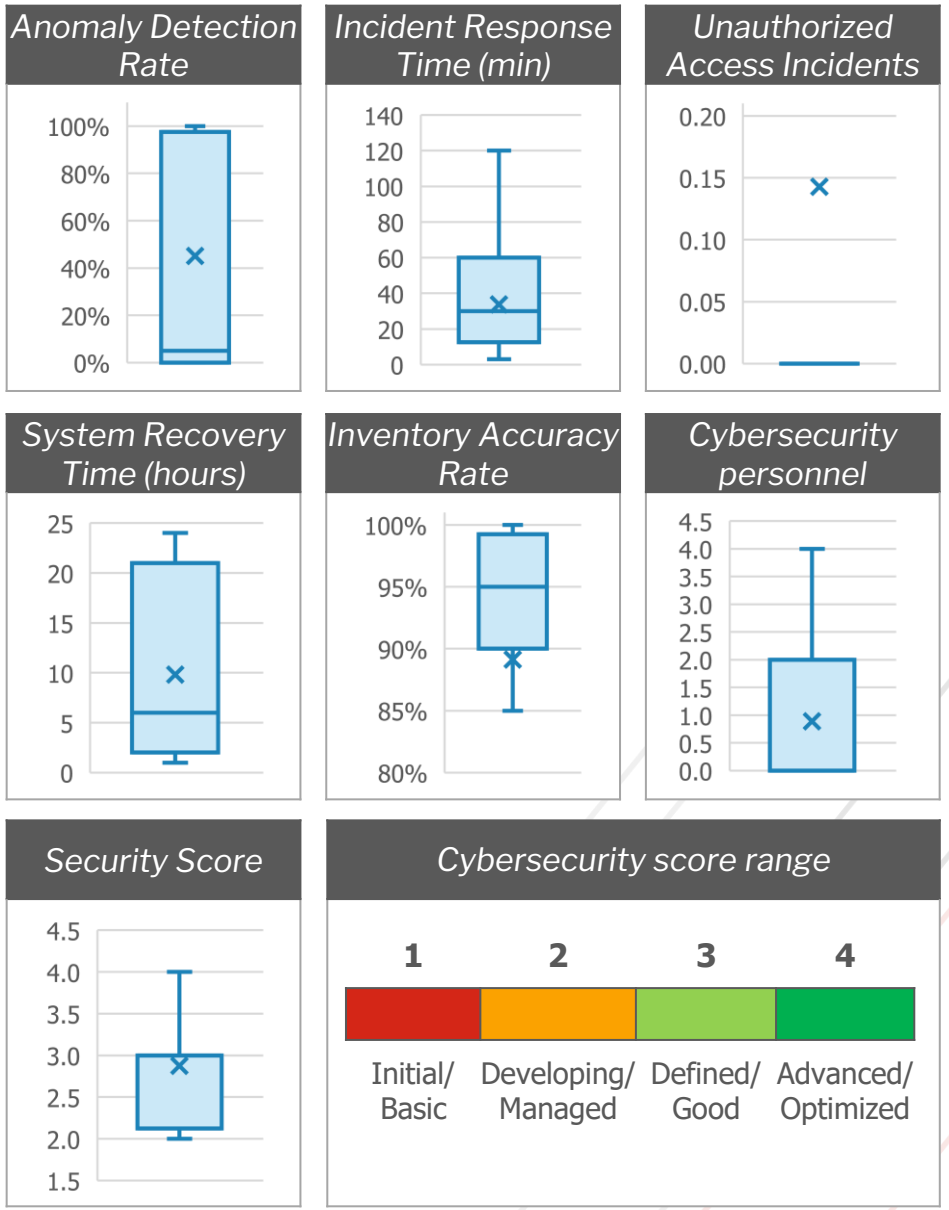
Cybersecurity metrics

Metrics used to track cybersecurity posture

- **Security scorecard score** is a quantitative assessment of an organization's cybersecurity practices, vulnerabilities, and risk level
- **Inventory accuracy rate** measures precision in tracking hardware and software assets, vital for vulnerability management
- **Unauthorized access incidents** where unauthorized users accessed secured areas
- **Anomaly detection rate** is the % of unusual activities that are identified
- **Incident response time** is the average time to respond to cybersecurity threats
- **System recovery time** is the average time systems take to become fully operational after a cybersecurity incident

Results

- Members report a median score of 3.0; Both the median and 75th percentile are due to the larger number respondents with a score of 3.0.
- 58% of members reported no dedicated cybersecurity staff; those reporting more than one are typically electric co-ops with staff that likely can share duties between the electric and broadband networks.



Cybersecurity best practices

Processes used to optimize cybersecurity posture

- Maintain an **inventory of digital and physical assets** to facilitate asset management and security assessments
- Use **monitoring tools** to identify and alert on unusual behavior or patterns
- **Access control** rules and procedures to restrict unauthorized access to sensitive information and systems
- **Governance and controls** ensure a robust security posture and compliance with industry standards
- Establish and maintain an **incident response plan** outlining the steps to take in the event of a cybersecurity incident
- Develop and frequently **test recovery processes** to ensure quick and efficient recovery from security incidents or data breaches

Results

- Cybersecurity scores suggest respondents are largely following cybersecurity best practices
- Members should conduct annual assessments by a third-party to confirm security maturity to gauge their cybersecurity posture

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Challenges and opportunities

Members cited several challenges (1 of 3)

Question: In a few words, describe your biggest challenges related to your broadband operations

Growth and competition

- Competition
- Competition building in our area is probably the largest
- Scaling the business to support customer demands in a highly-competitive marketplace
- Sales in competitive areas
- Competition driving down pricing
- Demonstrating the benefit of FTTH internet to an aging and poor Rural America
- Growth expectations vs capabilities
- Marketing campaign to keep installs consistent
- We are growing swiftly and not swiftly enough
- Messaging

Economics and regulatory

- Cost of building into low populated areas
- Cost of construction to new customers
- Managing increasing costs of workforce
- Inflation
- Continued inflationary pressure
- Real property taxation
- FCC and other regulations
- Real property taxation
- Regulatory uncertainty
- Costs, getting grants for neighboring areas

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Members cited several challenges (2 of 3)

Question: In a few words, describe your biggest challenges related to your broadband operations

Construction

- Processes, make ready and quality of contractors
- Supply chain, contractor management and labor, speed of deployment
- Manpower and available workforce, scalability in rapid deployment, accessibility to funding, and deployment challenges
- Due to the rural nature of our build the pace is slower than normal. It takes longer for construction.
- Make Ready Engineering
- Addressing demand from customers who require buried service
- Coordination of construction make-ready efforts outside service territory
- Coordinating new construction with maintenance operations
- Self execution of remaining portions of construction

Technology and systems

- Defining a technology roadmap from G-PON to XGS-PON and legacy hardware.
- Trying to get multiple operating systems to work together
- The ability to obtain a line of site with limited satellite options. We are in a mountainous region in the Pacific NW.
- Slow speed tickets which translates to WiFi issues
- WiFi

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Members cited several challenges (3 of 3)

Question: In a few words, describe your biggest challenges related to your broadband operations

Operations

- Locator errors and damaged fiber
- Technical Support & Locates
- Keeping in front of the 1000+ connections per month by continuing to connect customers in 15 days or less. Locates continue to be a stumbling block for construction and drops.
- Being prepared for cyber incidents.
- From a behind the computer outage management standpoint, we are working towards a. inhouse solution to manage our fiber outages. Visibility and managing our outages today is a challenge.
- Maintain customer satisfaction and employee satisfaction
- Scheduling and route optimization
- Transition to internal support versus contracted as main-line fiber build nears completion
- Knowledgeable staff

Members cited several opportunities (1 of 2)

Question: In a few words, describe your biggest opportunities related to your broadband operations

Expansion

- Serving rural areas accustomed to wireless internet
- System buildout and customer growth
- Expanding fiber into rural areas
- Looking to expand out of territory efficiently
- Build our network
- The potential growth in our area is huge. We are expanding in new areas.
- We are in a fast growth area so the opportunity for expansion is available
- Growth to off-system locations (IOU territory)
- Going into neighboring areas
- Expanding our network
- New markets
- Reaching unserved/underserved neighbors through grant funding.
- Universal coverage for our communities
- Winning ARPA-SLFRF and BEAD grants - then executing successfully
- BEAD grant opportunities

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Members cited several opportunities (2 of 2)

Question: In a few words, describe your biggest opportunities related to your broadband operations

Increased sales

- Increasing take rates and converting the 60,000 homes we have passed that did NOT take our service
- Gain higher take rate
- Sales growth

New services

- Continued applications integrated with the electric system with IoT for demand response
- Additional satellite options
- Upselling additional add-on services to increase ARPU
- The never-ending ability to change as technology and bandwidth consumption demands. Fiber allows us to scale.
- New products
- Services beyond the internet connection

Miscellaneous

- Now that construction is complete and contract crews are leaving, moving to maintenance mode
- More comprehensive project management and planning
- Continued opportunities to scale and/or bring in more operations internally vs. outsourced. Significant organic growth within market.
- Training and monitoring systems, single pane of glass

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We help you succeed

Across the functions of broadband operations, we've got you covered

- Marketing and Branding (Pivot)
- Sales and Marketing Automation (CrowdFiber)
- Customer Service and Help Desk
- Customer Experience (Pivot)
- Training
- Network Management
- Cybersecurity

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Acknowledgements and contacts

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Glossary

Metrics definitions: Sales and Marketing

Metric	Definition / calculation
Average Revenue Per User (ARPU)	Monthly subscriber revenue divided by average subscribers
Churn rate	Monthly deactivations divided by average subscribers
Customer acquisition cost	Sales and marketing costs divided by total customer additions; Costs include marketing, sales salaries and commissions, equipment subsidies, credit checks, and processing
Customer lifetime value (CLV)	The average EBITDA per customer of the average customer life (One divided by monthly churn)
Search Engine Marketing (SEM) Conversion Rate	Percentage of users who take a desired action, such as clicking through to a website or making a purchase, after clicking on a SEM advertisement
SEM Cost per Click (CPC)	Cost incurred for each click in a search engine ad
SEM Cost per Conversion	The cost of obtaining one desired action (e.g., purchase) through Search Engine Marketing efforts
Email Open Rate	Percent of email recipients that open an email; Calculated as opened emails divided by delivered emails
Email Click-through Rate (CTR)	Percent of email recipients that click a link in an email; Calculated as clicks divided by delivered emails
Email Conversion Rate	Percent of email recipients completing a desired action such as making a purchase, signing up for a webinar, or filling out a form
Social Media Marketing (SMM) Cost per Click	Cost incurred for each click in a social media marketing ad

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Metrics definitions: Customer Experience

Metric	Definition / calculation
NPS (Net Promoter Score)	Measure of customer loyalty from referral likelihood; Typically calculated as % of promoters (9-10) less % of detractors (0-6)
Transactional NPS	Post-service feedback on specific customer interaction
CSAT (Customer Satisfaction)	Rating of customer satisfaction with a provider; Typically calculated as satisfied (top 2 boxes on a scale of 1-5) divided by all responses
CES (Customer Effort Score)	Measures ease of interaction with a provider; Typically calculated as the average rating on a scale of 1- 1-7 with 1 representing “very difficult” and the 7 representing “very easy”.

Metrics definitions: Customer Service and Help Desk

Metric	Definition / calculation
Average Speed of Answer (ASA)	Average time taken for an agent to answer an incoming call, including time waiting in queues
Average Call Length	Duration of the average call from the time an agent begins the call and the end of the call
Call Volume per Month	Total number of calls received in a month
% Call In Ratio	Percentage of customers calling in a month; calculated as calls divided by average subscribers
% repeat calls within 30 days	% of customers with more than one call divided by all calls
% First Call Resolution	Percentage of customer issues resolved during the first interaction
% repeat calls within 30 days	% of customers with more than one call divided by all calls
% Call In Ratio	Percentage of customers calling in a month; calculated as calls divided by average subscribers

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Metrics definitions: Installation and Repair

Metric	Definition / calculation
Cost per Install	Total cost divided by number of installations; Cost includes success-based equipment and labor cost
Average Days to Install	Average number of days from when new service is requested to when installation is complete
Average Install Time	Average duration for installations, from arrival at the customer premises to when install is complete
Service Activation Time	The average time taken from service request to when service is operational
Average Time to Repair	Average duration from ticket creation to issue resolution for issues requiring a truck roll
Average Repair Time	Average time from when a truck is dispatched to when the issue is resolved
Locates per month	Number of locate processes (identifying and marking underground infrastructure) per month
% Repeat tickets within 30 days	Percent of tickets from customers contacting the provider at least twice with the same or similar issue within 30 days
Truck roll % of total trouble tickets	Percent of tickets requiring a visit to the customer premise
Cost per truck roll	Cost, including labor, of a visit to the customer premise

Metrics definitions: Network Management

Metric	Definition / calculation
Average # of Tickets per Month	Mean number of network support tickets received monthly
Average Resolution Time	Mean time taken to resolve a ticket
Outage Service Level Agreement	Commitment to maximum allowable downtime duration
Average Outage Restoration Time	Mean time to restore service after an outage
Mean Time to Repair	Average duration to fix a fault or issue
Average Packet Loss	Mean percentage of data packets lost in transmission
Average Latency	Mean time for data to travel from its source to its destination across a network
Average Busy Hour DL/UL speed delivered vs. to purchased speed	Average of speeds (download and upload) delivered in each tier (high, medium, and low) in the busy hour compared to the speed purchased in those tiers
Damaged Fiber Incidents	The number of incidents where the fiber infrastructure is damaged or compromised

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Metrics definitions: IT and Cybersecurity

Metric	Definition / calculation
System availability/uptime	Percentage of time a system is functional and accessible, excluding planned downtime
Change Success Rate	Measure of successfully implemented system changes compared to total attempted
Data Recovery Time	Duration required to retrieve and restore data to its original state after disruption or loss
Recovery Time Objective RTO Adherence	Degree to which Recovery Time Objectives are met, expressed as actual divided by the objective
Documentation Completion Percentage	Extent of documentation completed for processes, systems, or projects
Security Scorecard Score	Quantitative assessment of an organization's cybersecurity practices, vulnerabilities, and risk level; Scorecards based on the NIST framework typically are measured from 0 to 4
Inventory Accuracy Rate	Precision in tracking all hardware and software assets, vital for vulnerability management and compliance; Typically based on an audit of actual assets compared to that in IT's asset inventory
Unauthorized Access Incidents	Number of incidents where individuals accessed systems or data without proper authorization
Anomaly Detection Rate	Efficiency at which system threats or anomalies are identified against the total number of threats
Incident Response Time	Duration from the discovery of a security incident to its containment and initial mitigation
System Recovery Time	Duration for a system or application to become fully operational after a failure or disruption

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