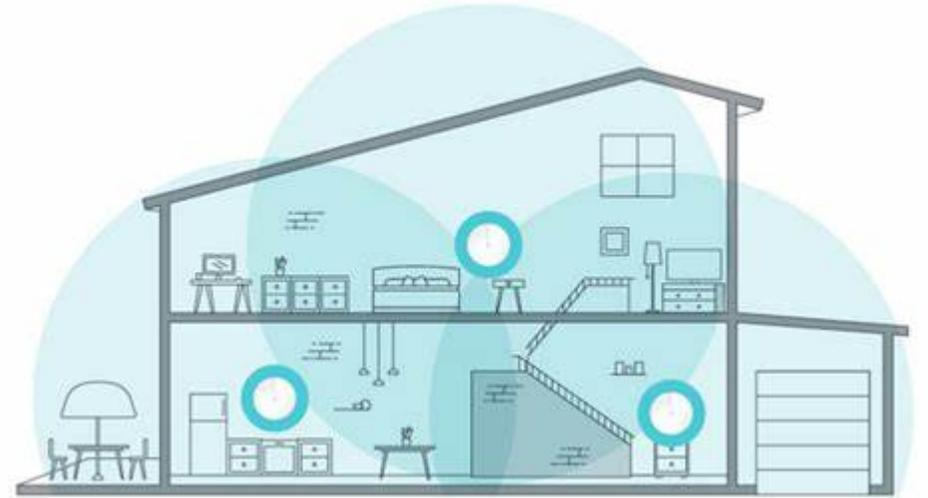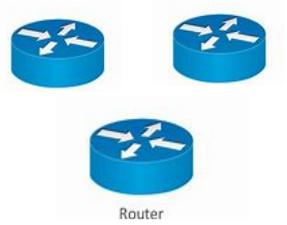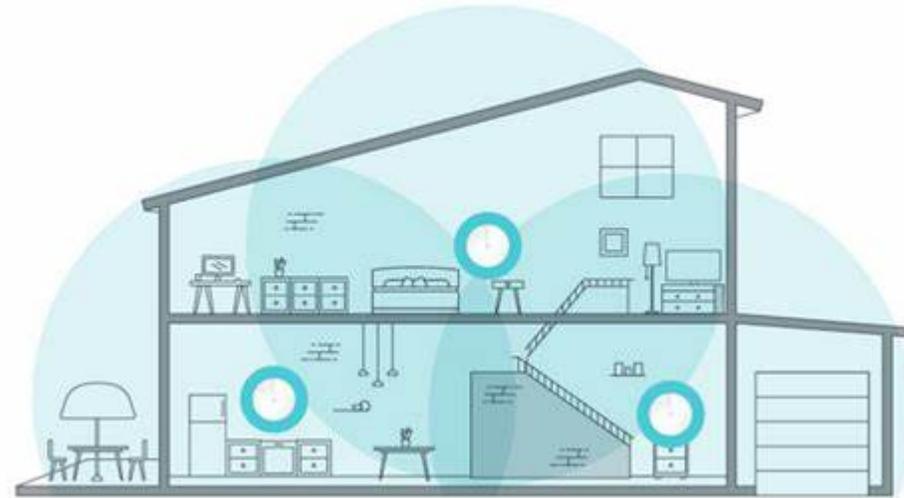# Case Study 1

Multi-stage research on modular routers

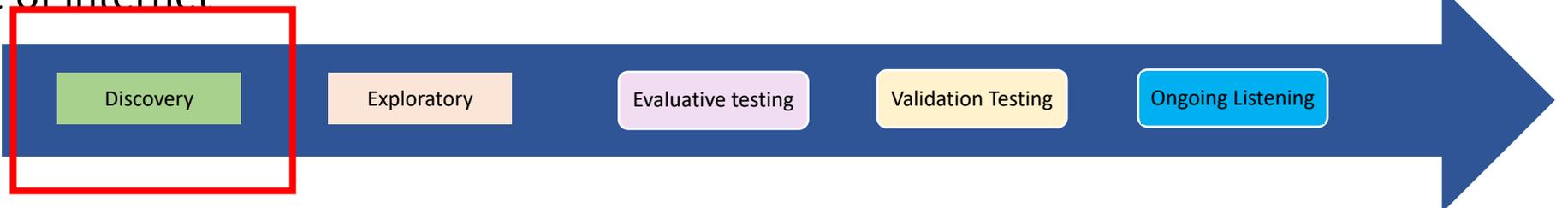# Multi-stage research on modular routers

- Modular *mesh* routers

- Seamless roaming

- Greater signal strength

- Faster speeds

Project overview

- Business wanted to build modular mesh routers

- Marketing wanted to target the "Connected Family" segment

- Research type ***Discovery***:
  - We needed to understand the connected family's needs, pain points and goals in relation to Wi-Fi → ***In-depth interviews***
  - Design for the connected family → ***Personas***
    - Family of 2 parents and 2 kids
    - Live in a big home
    - Heavy use of internet

| Discovery | Exploratory | Evaluative testing | Validation Testing | Ongoing Listening |

Screener

Linksys Connected Family screener

Introduction:
The screener is for the recruiting agency to identify a total of **14** participants for in home interviews. The Linksys research team will re-screen the recruited participants after initial agency screening. To do so, the Linksys research team will contact the participants by a phone call. The recruiting agency to provide any wavers, which need to be signed for release of contact information.

General info:

- All must be available for in home visit and study with Linksys research and design team members (each visit will have 2-3 team members)
- All must be available for up to 2 hours time slot to conduct the in-person interview.
  - ~120-minute in-depth interview with the respondent (our "host") for in-depth learning about their lifestyle and interest; for Owners of Wi-Fi routers, this might include a show-and-tell of current setup.

General recruiting specs:

- Must be member of household composed of at least 2 adulst and at least 2 kids.
- No recent-past market research participation (not within the past 6 months); not employed in a competitive category or industry.
- Employed outside of the house (terminate if unemployed, unless a full-time homemaker with a full time employed spouse)
- Mix of free-standing houses and town home/condominium/loft homes.
- Combined household income of at least $59K per year
- Must be considering the purchase of a new Wi-Fi router, Modem + Wi-Fi Router, or Range Extender in the next 6 months.

Respondents:

- 14 total recruits: 10 individuals and 4 whole families
- For Familiy recruits: 4 members of the family (2+ adults, 2+ kids) will be expected to participate during the interview (compensation to vary)
- 50/50 gender mix
- Ages 25-54

SCREENER

Name: _____

Address: _____

City: _____ State: _____ Zip: ____

Home Phone: (   ) _____   Business Phone: (   ) _____

[Ask to Speak to the Decision Maker of the House]

Hello, I'm _____ from (facility), a marketing research company. We're conducting a brief study about consumer products and we are asking qualified consumers to help us. I can assure you; we're not selling anything.
First of all …

1. Do you currently, or have you ever worked, in the following industries? Please choose all that apply.
   Company that manufactures or sells toys   _____ (Continue)
   Company that manufactures or sells automobiles   _____ (Continue)
   Company that manufactures or sell electronics
   (such as computers, cell phones, Wi-Fi routers, etc.)   _____ **[TERMINATE]**
   Company that conducts market research   _____ **[TERMINATE]**
   Company that does marketing or advertising   _____ **[TERMINATE]**

2. Which statement best describes your role in the decision of which electronics products you purchase for your home: TVs, computers, printers, smartphones, tablets, etc.?
   I am the main decision maker   _____ (Continue)
   I share the decision equally with someone else   _____ (Continue)
   Someone else is the main decision maker, but I have a say _____ **[TERMINATE]**
   Someone else is the sole decision maker   _____ **[TERMINATE]**

3. Gender **(Mark; ask only if unsure)**
   Male   _____ (Continue)
   Female   _____ (Continue)
   [SEE QUOTAS BELOW]

4. What is your age?
   18-24 years   _____ **[TERMINATE]**
   25-34 years   _____ (Continue)
   35-44 years   _____ (Continue)
   45-54 years   _____ (Continue)
   55-64 years   _____ **[TERMINATE]**
   65+ years   _____ **[TERMINATE]**
   [SEE QUOTAS BELOW]

Methodology

Study Details

- 14 in-home visits
- Mix of individual head of HH and full family visits
  - 7 female HH
  - 7 male HH
- Kids age mix
- 2-hour session

Topics Covered

I. Home environment
II. Wi-Fi technology
III. Common Wi-Fi activities
IV. Lifestyle
V. Family roles
VI. Psychographic

Respondent Qualifications

- Respondents were recruited based on identified segment profile
- All participants received an incentive

Discussion Guide

| CATEGORY	AREAS TO COVER	QUESTIONS	NOTES

1. Introduction	1. Intro
	 2. Occupation
	 3. Household members
	 4. Purchaser
		1. Tell us a little about yourself… (ex: occupation, household…etc)
		 2. What do you do?
		 3. How many live in your home?
		   a. Kids?
		   b. Ages?
		 4. Who makes the purchasing decision in the home?
		 5. Who influences it?	

2. Environment	1. Description of the home *Note the following and their effect on the network* 2. Walls 3. Size 4. Rooms 5. Floorplan	1. What is the living space of this house? 2. Do you have any attics or basements? 3. How many rooms are there? 4. What is the furthest spot that requires wireless connectivity? a. How is the connection there? 5. Are there lots of walls between your WiFi source and clients?	

3. Technology	1. Show us your Wi-Fi
	 2. Wifi location
	 3. ISP:
	   a. Router brand
	   b. Internet speed
	 4. Wifi equipment
	   a. # of units
	   b. Their understanding of them
	 5. Wifi usabge
	   a. typical tasks
	   b. how often
	 6. what do they do on the web
	   a. typical tasks
	   b. how often
		1. Show us your Wi-Fi equipment. Is that what you call it? Where is the Wi-Fi source situated?
		 2. Who is your Service Provider?
		   a. What kind of Internet speed did you sign up for?
		   b. Are you getting what you signed up for?
		   c. *Note the brand of the gateway/router and the number of units.*
		 3. Is there other networking/Wi-Fi equipment in the home?
		   a. *Note: Do they recognize what they are?*
		   b. Why that many? History?
		 4. Generally, how do you use your Wi-Fi?
		   a. typical tasks
		   b. how often
		 5. What do you do on the web
		   a. typical tasks
		   b. how often	

4. Devices Connected	1. wired devices
	   a. How many?
	   b. type of activity
	 2. Wireless?
	   a. Type of activity on computers
	     i. Browser, web-surfing, torrent?
	     ii. Media streaming? Type?
	   b. Type of activity on mobile devices
	     i. OS, web-surfing, research…
	     ii. Media streaming? Type?
		1. How many wired devices do you have? *Identify what they are*
		 2. What kind of activity do you do on these devices? Start with the ones you use most often
		 3. How many wireless devices do you have? *Identify what they are…*
		 4. What kind of activity do you do on these devices? Start with the ones you use most often.
		 5. Do you have any media devices and if so what are they? How much time do you spend on them on average per week?
		 6. On average, how many of your wired devices are usually using the internet at the same time?	

	3. media devices a. type of streaming 4. Frequency	7. On average, how many of your wireless devices are usually using the internet at the same time?	

Synthesis

Affinity Diagram
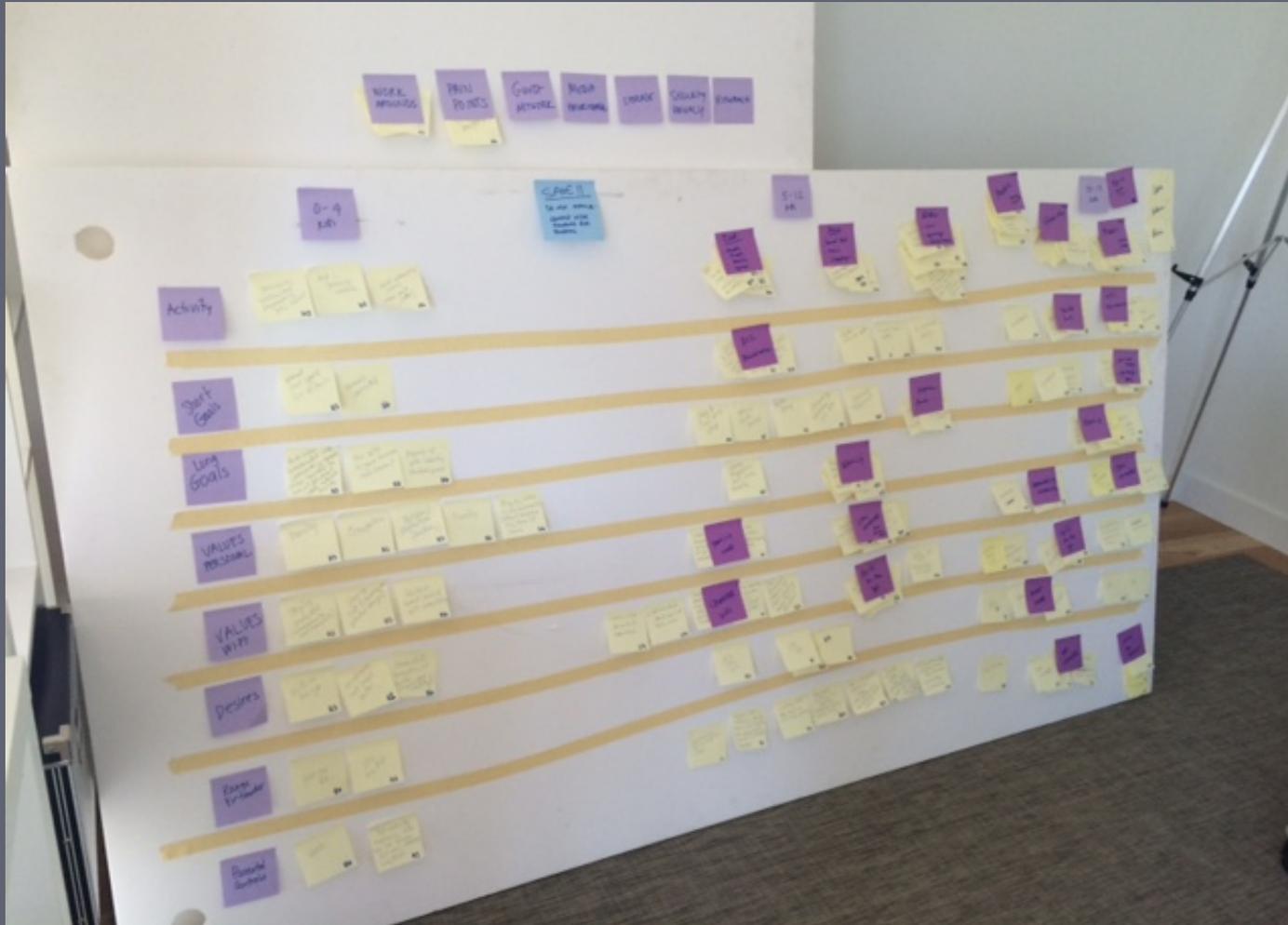
Conversations with "Connected Family" consumers validate previous findings. When it comes to routers, they operate in a "**set & forget**" mind frame. They desire a powerful yet **easy to use** solution.
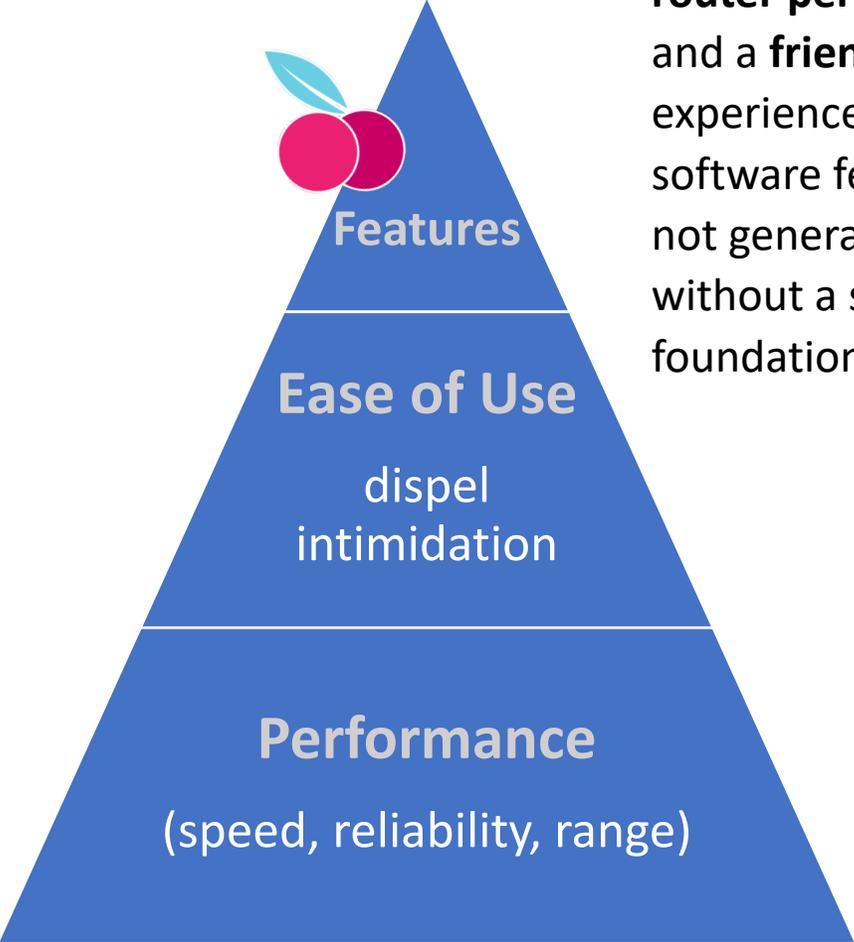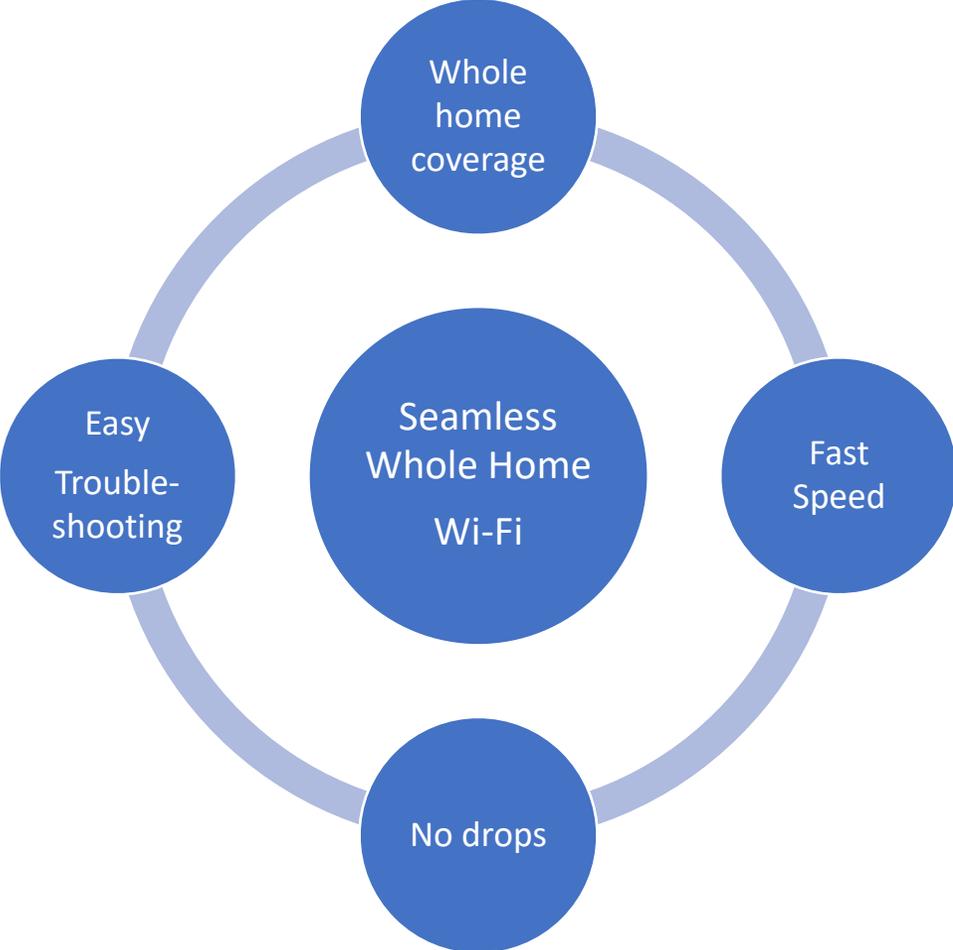
The bullet-proof way to delight the "Connected Family" is to deliver **top router performance** and a **friendly user** experience. Additional software features will not generate delight without a solid foundation.

Whole home coverage

Easy Trouble-shooting

Seamless Whole Home Wi-Fi

Fast Speed

No drops

Features

Ease of Use

dispel intimidation

Performance

(speed, reliability, range)

Meet the "Connected Family" Personas

HEATHER: The Protective Mom

TOM: The Trusting Dad

Heather: The Protective Mom

"My kids mean everything to me, I want to instill morals and teach them to be responsible; sometimes that means setting the right limits."

37, Married, Head of Household,
Mom of Tweens, Restaurant Blogger

Background

Heather is the head of household at home. She lives with her husband Curt, and 2 kids, Maggie who is 5 and Daniel who just turned 11. Heather hosts a popular restaurant review blog for a living. Her friends and family would describe her as a caring, dedicated mom. She works hard to provide for her kids, and they always come first.

At home, Heather has a plethora of electronic devices. She runs a variety of activities on them such as social networking, video watching, texting and calling. For online videos, Heather and Curt also own a Smart TV. They watch their favorite TV shows through Netflix. Curt is an avid gamer. On weekends he connects with other gamers online. Recently, Curt and Heather added Amazon Echo. They frequently command Alexa to stream music, and share news and weather updates.

Heather does everything she can to make sure her kids have everything they need to succeed in life. She also likes to reward them with nice gifts (bikes, new tablets) if they earn it with chores and good behavior.

Heather's kids are at the age where she is instilling values and morals. Guiding her kids to become good citizens is her main motivation. Therefore, regulating her kids' time on Wi-Fi and limiting access to inappropriate content is extremely important for her.

For these reasons, 5 year old daughter, Maggie, only uses the Nabi tablet that Heather bought her through friends who recommended it. Maggie can only access age appropriate apps for games and other content.

Daniel, on the other hand, is a much bigger concern for her. As an 11 year old, he's far more likely to get hooked on his mobile phone, social networking sites and tablets.

She's adopted a "Teach and Test" model by teaching him to know better and only access sites or apps that she's approved. She tests this by randomly checking his text messages, search history, apps and general activity.

Heather has gone as far as creating a master cloud account that can give her full access to his sub-account as a backup plan to check in case he has broken the rules.

Heather: The Protective Mom

Values

- My family comes first
- Teaching my kids about hard work and ethics
- Playing an active role in the community
- Spending quality time as a family
- Staying connected with family and friends

Goals

1. **Keep Wi-Fi working:** to efficiently meet my family's needs
2. **Staying up to date**: by upgrading to new technology as it emerges
3. **Staying connected:** with friends, family and the world
4. **Protect my kids**: keep my kids away from inappropriate content
5. **Teach my kids good habits**: set time limits so my kids stay balanced with school and play

Parenting Attitudes

Family time is important for me and comes first before all other distractions

Only age-appropriate apps are available on my kids' Wi-Fi devices

I limit my kids activities on Wi-Fi by taking the devices away if they are on them for too long and particularly during dinner and before bed

But, I also need to know what my kids view on Wi-Fi to make sure they do not accidentally or unintentionally access inappropriate content for their age

Technology Attitudes

- My husband and I do the research and shop around before buying electronics. I ultimately decide and make the purchase myself
- I invest in tablets, laptops, and smart devices for the home to stay up-to-date and meet the needs of my growing family
- Tablets are used often for video streaming to relax in the living room or bedroom
- I love to stream music while at home

Media Habits

- I use Pinterest regularly for recipe ideas.
- Social networking sites like Facebook and Twitter connect me with family and my blog devotees
- I watch movies on Netflix and Hulu regularly to catch up on shows I love like MasterChef
- I love listening to music on Pandora while I explore new recipes

Outlook on Wi-Fi

- I want my Wi-Fi setup to be easy
- I expect my Wi-Fi to just work
- I want reliable Wi-Fi everywhere in the home
- I do not have the time, interest, or knowledge to figure out how to troubleshoot issues myself

Heather: The Protective Mom

37, Married, Head of Household,
Mom of Tweens, Restaurant Blogger

A Day in the Life

Heather and Curt's day starts at 6:00 AM. Once she's showered, she quickly runs through her phone's messages, news and social networking updates while having her coffee. After about 15 minutes of "me" time, she gets breakfast ready for the family and preps her kids for school. By 7:00 AM, Curt is off to work. He is looking forward to a full day working with financial investors. After dropping off her kids at school, Heather heads back home and gets comfy on her work chair for some blog ideas to post for the day. Heather worries about her articles and wants to keep her followers interested.

Occasionally, Heather steps away from her desk and walks around the backyard for some inspiration. While checking her phone, she notices she has lost connection to her Wi-Fi. Frustrated, she turns the Wi-Fi off her smartphone and continues browsing through her cellular data plan. Wi-Fi drops have become "normal" around the house.

After some hours of blogging, she heads to the kitchen to start dinner. While prepping her ingredients she commands Alexa to play some smooth jazz through Pandora. Somewhere in the middle of preparing a salad, she remembers Daniel has basketball practice tomorrow. So she commands Alexa to set a reminder to take Daniel to his practice at 3:00 PM tomorrow.

Sometime around 4:00 PM, Curt arrives home with the kids. Around 5:00 PM, the family gathers for dinner time. The kids are asked to put away their phones or gadgets and talk about their day during the meal.

After dinner, Heather asks Daniel, her 11 year old son, to turn in his smartphone. She and husband Curtis have been checking the search history on his phone ever since they found him looking at pictures of naked girls. They had not noticed he had been doing so because he typed "gurls" to avoid being caught. Since then, Heather has blocked all inappropriate words and typos she could think of directly on his phone's browser. She wishes there was a way to do that on all Wi-Fi devices at once.

Around 7:00 PM is peak time for Wi-Fi use. The kids are playing games on their iPods and tablets. Heather is in the living room watching "Fuller House" with hubby before they all start getting ready for bed. 20 minutes into the show, TV becomes choppy while still streaming. The kids are also complaining about the bad connection on their games. Flustered but unsurprised, Heather turns the TV off then on in hopes that the trouble goes away. After a few attempts with no avail, she gets up and power cycles all of her Wi-Fi equipment – something that she and Curtis have tried before. After a few minutes of waiting, the connection recovers. Curtis hopes this doesn't continue to happen because he's been eyeing a game he'd like to download and play over the weekend. By 9:00 PM, before wrapping up for the day, Heather and Curt read to the kids their favorite bedtime story.

Tom:
The Trusting Dad

45, Married, Head of Household,
Dad of Teens, Car Salesperson & eBay Dealer

"My kids are good kids, they know not to get in trouble. I let them explore and make mistakes because sooner or later they will leave the nest."

Background

Tom is the head of household at home. He lives with his wife, Susan, and his 16 year old twins, Maddox and Alexis. Tom is a salesperson at a local car dealership. He also sells collector boats on eBay as a side job. His friends and coworkers would describe him as hard worker and ambitious.

Tom is in charge of managing all technology at home. The family has a variety of Wi-Fi devices that they use to stream movies and play online games. The most recent addition was a PS4 they bought for Maddox, who loves to game.

Sometimes Tom will bond with Maddox over online gaming. Susan and Alexis prefer to stream music on Spotify, pin recipes on Pinterest, and stream chick flicks on Netflix.

The family recently fully renovated the home. Part of the renovation included adding a smart door lock to their front porch can be remotely accessed from their smartphone.

Tom's main motivation is to keep everyone happy. His family sees him as a hero because he always finds a solution to their problems. **He is the go to guy for Wi-Fi issues**. Around the home, Tom is a bit of a handy man. He enjoys completing DIY home improvement projects.

Tom knows Wi-Fi plays a big role in the family's happiness. Hence, he is always looking for new gadgets online. Lately he has been thinking of buying a 4K TV for the twins to stream movies when their friends come over. However, he watches his budget and will make sure he gets a deal whenever possible.

Tom likes to stay current with technology. Before purchasing electronics, Tom checks CNET for products reviews. He also follows radio show host, Leo Laporte on YouTube, for product review updates.

Despite his love for tech gadgets, when it comes to routers, Tom is not a tinkerer. He finds Wi-Fi issues extremely frustrating. When the Wi-Fi is down, he knows he is going to hear a lot of angry complaints from his family, but he is too impatient to troubleshoot. He wishes there was a Wi-Fi solution that does not require him to move a finger for it all to just work.

Maddox and Alexis are free to use Wi-Fi as long as they don't go to bed with it. Tom and Susan feel they have instilled enough awareness to their kids about the drawbacks of having public profiles over the web. They are watchful of their kids but for the most part trust them to make sensible choices. They realize how much their teens depend on Wi-Fi for school and would not want to limit them from growing, given the abundance of knowledge opportunities online.

Tom: The Trusting Dad

45, Married, Head of Household,
Dad of Teens, Salesperson at Car Dealer

Values

- I must keep my family happy because, when they are happy, they don't complain, and that makes me happy
- I am watchful of my kids' behavior but I trust them to make good choices
- I enjoy improving and renovating my home
- I like to stay up to date with technology but will hunt good deals

Goals

1. **Keep Wi-Fi working:** to efficiently meet my family's needs
2. **Staying up to date:** by upgrading to new technology as it emerges
3. **Vibrant entertainment**: optimal gaming and streaming so my kids can be entertained at home
4. **Reliable Wi-Fi for school**: so my kids can complete and submit homework

Parenting Attitudes

- Allowing my kids to explore is important and setting limits that are too stringent may stump their intellectual growth
- Manners are important, that is why texting is not allowed during dinner
- I rather let my kids bring their friends home and watch movies in the living room, than not knowing where they are
- I trust my kids 100% but I still need to be aware of what they are up to

Technology Attitudes

- I like to buy new technology but will wait until the price is right
- I extensively research before buying technology, especially because I know I can find it cheaper online
- HD streaming is important to us because movie nights is usually how we bond

Media Habits

- I watch movies on Netflix and Hulu with my family on weekends' nights
- I watch home improvement tutorials on YouTube
- I occasionally game with my son

Outlook on Wi-Fi

- My family needs streaming and gaming with no buffering
- Wi-Fi troubleshooting is not my forte, but if there is an issue, help me fix it as soon as possible so my family stops complaining

A Day in the Life

Tom's day starts at 5 AM. After drinking coffee with his wife he leaves to work at the car dealership. He usually leaves so early he does not get a chance to say goodbye to the twins in the morning. He is hoping he can leave work today in time to be home early for dinner and spend time with the twins.

Around 10 AM, Tom gets a call from Susan complaining about the Wi-Fi signal being too weak on her laptop. She is trying to find a recipe for dinner but the webpage does not load. He tries to explain to her how to power cycle the router over the phone, but Susan has a hard time understanding, so they hang up. A few hours later, Susan calls him back to tell him the Internet came back on. He is relieved, but a bit annoyed by not knowing what caused the problem.

Tom finishes his last work meeting at 5 PM and heads home. When Tom gets home, he relaxes by watching the news in the living room before the family gets together for dinner. While setting the table for dinner, Susan decides to stream ambience music from Pandora through her iPhone. Both teens are in their bedrooms, Maddox is gaming on his PS4, while Alexis is snapchatting with her friends. Before coming down to the dinner table, Alexis takes a selfie, and her mom quickly asks her to put her phone away while eating dinner.

A little after dinner, Tom catches up on his eBay bidding. He is also reading product reviews on CNET about a WeMo light dimmer. He thinks it would be a good addition for the entertainment room, but he is going to try to find a better price on Amazon. In the meantime, Susan is relaxing in her bedroom watching "The Voice" on her smart TV. The teens are back in their rooms watching a Trigonometry tutorial on YouTube to prep for tomorrow's exam. Before they go to bed, they plan on submitting a Science assignment through their Gmail account using Google docs.

It is almost 8PM and the doorbell rings. It is Maddox's friend, who is coming to play Clash of Titans with him tonight. Maddox shows his friend a video on YouTube that teaches them how to win an underworld battle; they are going to try this technique tonight. Alexis is also on YouTube watching a makeup tutorial for her upcoming picture day at school. She is also checking her Tumblr updates and replying to her friends' comments on the selfie she took before dinner and uploaded to Instagram.

At 9 PM, Tom hears some curse words coming from Maddox's bedroom. Maddox and his friend are enraged because the Wi-Fi went down while they were gaming. Tom tries to troubleshoot the network and power cycling the router seems to do the trick. At 9:30 PM, Maddox's friend leaves and both twins are sent to bed. They leave their smartphones in the kitchen to charge overnight, and also because their parents do not want them to stay up too late texting and browsing.

Recommendation

Heather, The Protective Mom

Focusing on Heather as the main persona, positions Nodes at an early stage in the "Connected Family" lifecycle. In addition to delivering on her basic Wi-Fi needs now (reliability, speed, and range), there is an opportunity to deliver on a highly emotional parental concern: regulating children's exposure to Wi-Fi content. Securing a space in Heather's mind at this stage, will give Nodes a chance to grow with her family and build brand equity over time.

As Heather's kids grow, her household needs will become gradually more demanding. Mobile app gaming will be replaced by online gaming, social media will enter the kids' life as a means to stay connected with friends, and school work will become increasingly Wi-Fi dependent.

Heather is likely to adapt societal and technological changes. Therefore, we must continue to study her. Following Heather's family evolution may give rise to new insights to continually develop practical solutions for their emerging Wi-Fi needs.

Standout discoveries

Finding:
- We learned for instance that users didn't just want their Wi-Fi to just work but if there is an issue, there is no guidance. They're on their own troubleshooting based on past ISP calls

→

Insight:
- Users need assistance in not only identifying what the problem is but also troubleshooting it.

→

Impact:
- App was modified to proactively notify if a node (AP) or Internet went down and help was added to help users troubleshoot an issue.

Finding:
- Monitoring and controlling kids' use of the internet was a concern and a shore for parents when there are too many devices to control

→

Insight:
- Parents don't have a way to control their kids' use of the internet from a single place AND on a network level.

→

Impact:
- A parental controls service was introduced in the app to help parents control internet use through manual control or age-based blocking while protecting them from hacks and malware.

Finding:
- We learned that users shared their wifi credentials with their friends and family and they often enter the password on their guest's phones or devices to make it easier and less cumbersome on them.

→

Insight:
- There isn't an easy quick and convenient way to share your Wi-Fi password with others

→

Impact:
- A feature in our app was added to text, email or copy the Wi-Fi password.

Hurdles

- Personas were completely new to the business. And so, to sell personas to multiple departments was going to be a challenge.
- We tackled this from multiple angles:
  - We involved all stakeholders including sales, Marketing and brick & mortar trainers
  - We printed out the personas and posted them across our building on multiple floors
  - We actively worked with leads across departments to spread the word to colleagues and help evangelize and infiltrate the personas into their teams
  - We gave examples on how personas can be applied in marketing, web content and packaging.

Persona impact

✓ Personas were evangelized and publicized across the business through different channels for greater visibility and adoption

✓ They were integrated in daily cross-functional conversations for greater focus and alignment across teams and departments

✓ They helped shape packaging, messaging and marketing of product.

✓ Sales team and trainers adopted them in their narratives which made the product line more personable and convincing

✓ They helped in recruiting for future surveys and usability testing

HEATHER: The Protective Mom

TOM: The Trusting Dad

What we could have done differently especially if we had more time

- **Diary study**
  - It would enable us to see how people interact with wifi over the course of a long period.
  - Log collection to help understand disparity/dichotomy between user perception of what works/doesn't and technical states of network.
- **In depth interviews from a select few of diary study participants.**
  - To dig deeper into some of the pronounced issues themes or patterns that would arise from a diary study.