



Team "XpaNet"

Problem: Enhancing Cellular Network Connectivity and Reliability

Camp Shelby Joint Forces Training Center constantly battles with connectivity. Members undergoing field training at Camp Shelby need strong, stable cellular network coverage to effectively communicate with individuals on and off base. Cellular network coverage is spotty and unreliable throughout the base. Because of the frequently high volume of individuals that can be on base at a time, cellular networks are often overloaded and incapacitated.



Meet the Members of XpaNet



Jacob Smith

B.S. Business Administration
(Entrepreneurship)

Interests: Cybersecurity, Small
Business, Economic
Development, Information
Systems



Lacie Borel

B.A. Criminal Justice

Interests: Criminology, Prison
System/Reform, Mental
Health, Psychological
Theories of Crime



Jasmine Kelley

B.A. Economics (Mathematics),
B.S.B.A. Management, Minor in
Mathematics

Interests: Regression Analysis,
Behavioral Economics, Labor
Economics, Artificial Intelligence,
Operations Management

Interviews

Problem Sponsor

- Total Interviews Conducted: 110
- From 32 Different Working Locations
- Chief Warrant Officer Jesse Lindsey



xfinity



ZYXEL
Your Networking Ally



OLD FORT JACKSON
National Historic Landmark

SOUTHEASTERN
LOUISIANA UNIVERSITY



Vertex Platform
aerospacE AEROSPACE

CELLSITE
SOLUTIONS, LLC



PEARL RIVER
WILDCATS

Wilson Amplifiers



Fort Worden
PORT TOWNSEND
A HISTORIC GATHERING PLACE



Ole Miss



MISSISSIPPI DELTA
COMMUNITY COLLEGE



verizon

alltech

cspire H4D

Big Cat Aerial
Professional Drone Services

HINDS
COMMUNITY COLLEGE



50 years
asi
aerial services inc.

Starting Problem

Camp Shelby Joint Forces Training Center constantly battles with connectivity. All service members and units who work at Camp Shelby need access to the internet to perform their duties and responsibilities. Because of the frequently high volume of individuals that can be on base at a time, cellular networks are often overloaded and incapacitated.

- At first, we thought:
 - We could reduce strain on cellular networks by improving accessibility to Wi-Fi at Camp Shelby.
 - Most people on base had problems connecting to Wi-Fi and cellular.
 - There was not proper hardware and infrastructure present at Camp Shelby for the number of people who needed access to Wi-Fi.
 - Camp Shelby did not have proper contacts to Wi-Fi providers.
 - Most people on base would benefit from enhanced access to Wi-Fi, and this would also improve cellular connectivity.



Starting Problem, Pt. 2

The Mission Model Canvas

Mission/Problem
Description: Wireless and Cellular
Network Connectivity

Designed by: XpaNet

Week 3

Version:1.0

<p>KEY PARTNERS</p> <ul style="list-style-type: none"> -Camp Shelby Leadership -Private sector network/IT service providers -Department of Defense contractors 	<p>KEY ACTIVITIES</p> <ul style="list-style-type: none"> -Identify the root cause of network problems -Assess possible solutions -Communicate with experts 	<p>VALUE PROPOSITIONS</p> <ul style="list-style-type: none"> -Assessment of the underlying causes of network connectivity issues that Camp Shelby experiences -Proposal of necessary hardware and infrastructural requirements needed for solution -Solves unreliable network issues -Streamlines communications on base 	<p>BUY-IN & SUPPORT Camp Shelby leadership:</p> <ul style="list-style-type: none"> -Bobby Gin: Post Commander -Randall Mantooh: Deputy Post Commander -Gary Graham, Command Sergeant Major Private Sector Network/IT Company 	<p>BENEFICIARIES</p> <ul style="list-style-type: none"> -Camp Shelby personnel benefit by having a strong wireless network connection. -Households living in the surrounding area may benefit if cellular network is bolstered. Tenants -177th Armored Brigade -154th Regiment Regional Training Institute -Youth Challenge Academy
<p>MISSION BUDGET/COST</p> <ul style="list-style-type: none"> -Equipment costs -Service Costs -Maintenance Costs -Budget uncertain as of current 		<p>MISSION ACHIEVEMENT/IMPACT FACTORS</p> <p>Proposal for a solution that provides:</p> <ul style="list-style-type: none"> -a financially feasible/sustainable option -Consistent, reliable coverage -Sufficient bandwidth to support up to 8,000 personnel within the base 		

Getting Out: Camp Shelby Joint Forces Training Center - Week 3

- To see the problem for ourselves, we took a trip to Camp Shelby.
- We met with Chief Warrant Officer Jesse Lindsey, who further outlined the problem and introduced us to other beneficiaries on base.
- Through interviews, it was made clear that this was a universal problem.
- Tests conducted throughout the garrison showed unreliable connection and slow speeds.



Initial Interview with IT Supervisor, Captain McMillan – Week 6

- We went into this interview believing that we had two separate problems: inside connectivity and outside connectivity.
- Talking to Captain McMillan, we learned that Wi-Fi was being implemented into 150 buildings on base.
- This helped us condense our problem statement to focus solely on outdoor cellular network issues.
- This is when we began leaning towards C.O.W.S or other types of infrastructure that could be brought on base to help boost specifically outside connection.



Where did you end up and where are you going?



We are now specifically helping with cellular communications at Camp Shelby.



We have found connections at AT&T and C Spire for Camp Shelby to communicate with regarding COWs/COLTs/additional hardware.



We have analyzed the pros and cons of waiting for 5G, continuing to order COWs/COLTs, and buying additional hardware (ex: boosters/repeaters).



We will relay this information to our problem sponsor, Chief Lindsey, and anyone else who might benefit from the knowledge, such as Captain McMillan.

The Mission Model Canvas

Mission/Problem
Description: Network Connectivity

Designed by: XpaNet

Date: 02/12/2020 Version:2.0

KEY PARTNERS -Camp Shelby Leadership -Private sector network/IT service providers -Department of Defense contractors -Camp Shelby IT supervisor	KEY ACTIVITIES -Communicate with experts in cellular connection and networking -Locate where additional infrastructures could be implemented	VALUE PROPOSITIONS Improved Knowledge on Network Coverage Options -These options could lead to a more capable cellular network -These options could decrease the load on the cellular network Streamlined Communication -Communication channels improved and quickened. -Information will allow Camp Shelby Personnel to reach out to references at AT&T and C Spire to provide advice and assistance with obtaining orders.	BUY-IN & SUPPORT - Support of Camp Shelby Leadership to expand budget to increase infrastructure if needed. -Help from network companies to order products and conclude which option would be of best help to the base.	BENEFICIARIES Camp Shelby Personnel -IT Supervisors, Army Specialists, Army Medics, Bank Organizations in Residence -154th Regiment Regional Training Institute, Youth Challenge Academy, Bank Tellers, etc. Non-Military Entities -Households in the surrounding areas Temporary Residents -Military personnel training on base
	KEY RESOURCES -Capital -IT Staff/Personnel -Military Advocates		DEPLOYMENT -Creating a comprehensive document to relay information to Camp Shelby personnel regarding options for improving cellular communications: this document will also include references for communications.	
MISSION BUDGET/COST Costs: Equipment, service, Maintenance, etc. Budget: No fixed budget, military will work with the companies to negotiate prices.		MISSION ACHIEVEMENT/IMPACT FACTORS <u>Camp Shelby Leadership</u> - Decision makers will be able to look at a single document that outlines potential plans of action and their respective strengths. <u>Camp Shelby Personnel</u> – Provided with contact information for leads within the industry that can be contacted when implementing any of the potential decisions.		



Potential
Decisions

Wait	Wait for 5G
Continue	Continue to use COWs/COLTs
Buy	Buy more hardware (ex: boosters, repeaters, etc)

Pros/Cons of Waiting for 5G



Pros:

-Federal funding will be used to supply 5G.

-Additional towers will be added (potentially hundreds in Camp Shelby's surrounding area)

-Additional towers could increase cellular connectivity capacity

Cons:

-This is expected to happen in 2021 in the local area.

-Individuals at Camp Shelby will continue to face connectivity issues until then.

-There is uncertainty. This solution might not be a definite fix.

Pros/Cons of Continuing to Use COWs/COLTs



Pros:

-Temporary towers provide additional cellular capacity when current capacity is overloaded. (Example: during surges)

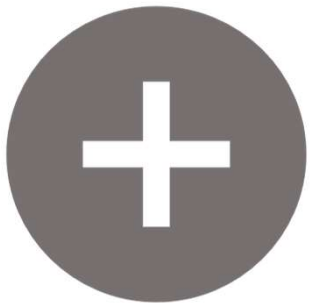
-Camp Shelby personnel can negotiate with cellular providers to reduce costs.

Cons:

-It would be costly to use temporary towers to fix everyday connectivity issues.

-Temporary towers would be used during surges, which would not provide stable, daily connectivity coverage.

Pros/Cons of Buying More hardware



Pros:

-Additional boosters/repeaters could provide stronger connections in areas of the base that typically have weak connections.

-The coverage that boosters/repeaters provide could be a more stable option. This is an option for everyday coverage.

-Camp Shelby personnel can negotiate with hardware providers to reduce costs.

Cons:

-Additional funding would need to be allocated to purchasing hardware.

-Testing would need to occur to see which areas of the base are the best fits for boosters/repeaters.

-Boosters and repeaters do not supply large area coverage, so multiple would need to be purchased.

MVP

Decision-Making Matrix (Weighted Scoring)

Options	Availability	Range	Price	Certainty	Stability	Total Score (No Weight)	Total Score (Weighted)
Weight	10%	20%	40%	10%	20%		
Wait for 5G	2	5	5	2	5	19	23.4
Continue to Purchase COWs/COLTs	4	3	2	4	3	16	18.8
Buy Additional Hardware (Boosters and Repeaters)	5	1	3	5	4	18	21.2

Scoring: 1-5

5 is the highest with a score of 5

4 is second with a score of 4

3 is third with a score of 3

2 is fourth with a score of 2

1 is lowest with a score of 1

Connections at AT&T and C Spire for the Purchase of COWs/COLTs/Hardware



Jerry Poole
Senior Network
Consulting Engineer at
AT&T



Maher Saab
Business Planning Mgmt.
at AT&T



Brian Biernat
Telecommunications
Engineering & Operations
Executive at C Spire

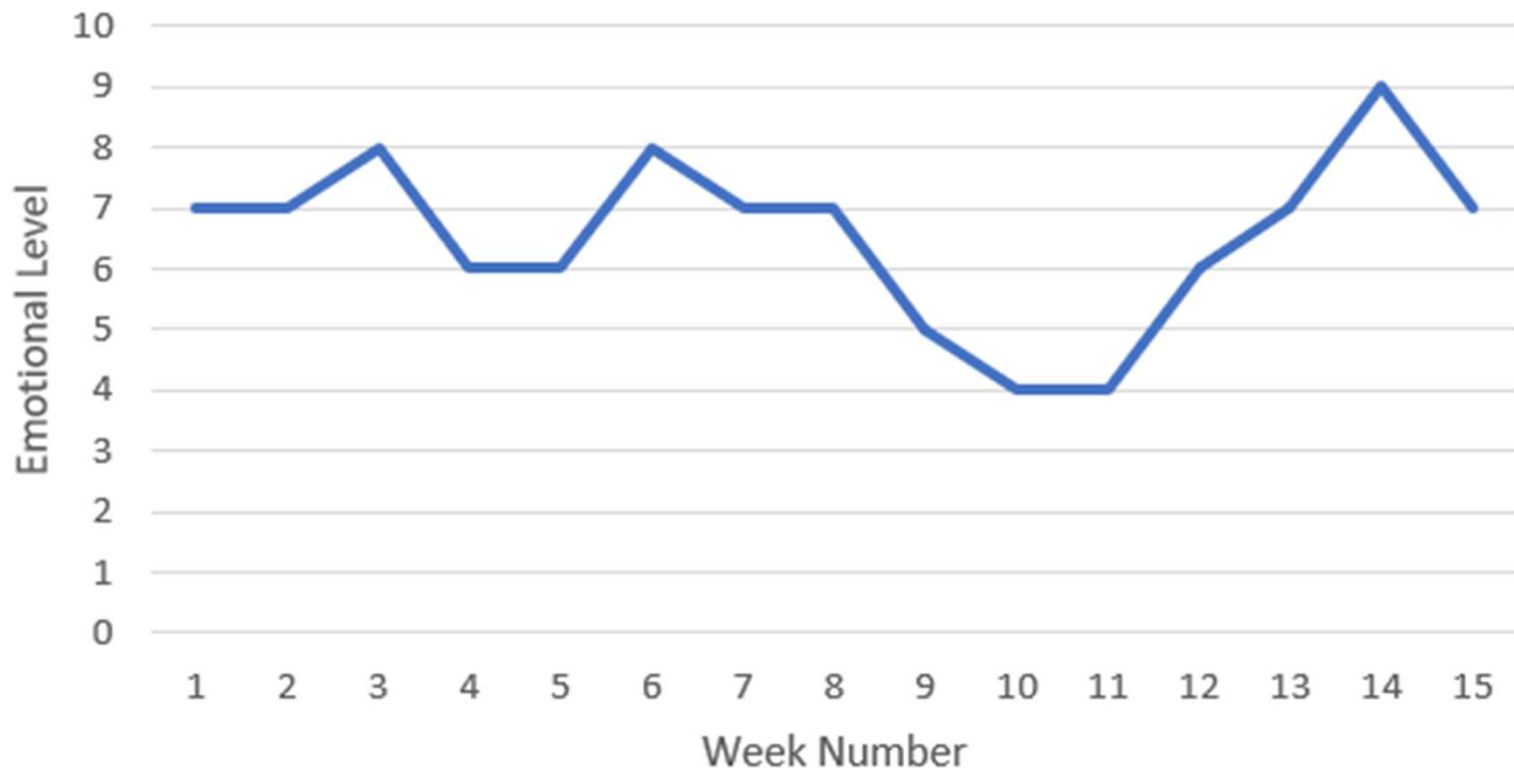
Dual-Use Product

- The military will benefit from improved cellular communications at Camp Shelby. However, this will also positively impact civilian workers/visitors.

Continue Project or Leave?

- Our team would like to continue to assist Camp Shelby in finding a solution to their connectivity problems.
- This has been a very influential semester, and we feel as though we have just grazed the top of potentially solving this problem. We do not want to give up now!

Weekly Emotional Level



Thank you!

- Chief Warrant Officer Jesse Lindsey
- IT Supervisor Captain William McMillan
- Dr. Henry Jones
- Dr. Joshua Hill
- Mr. James Wilcox

Appendix



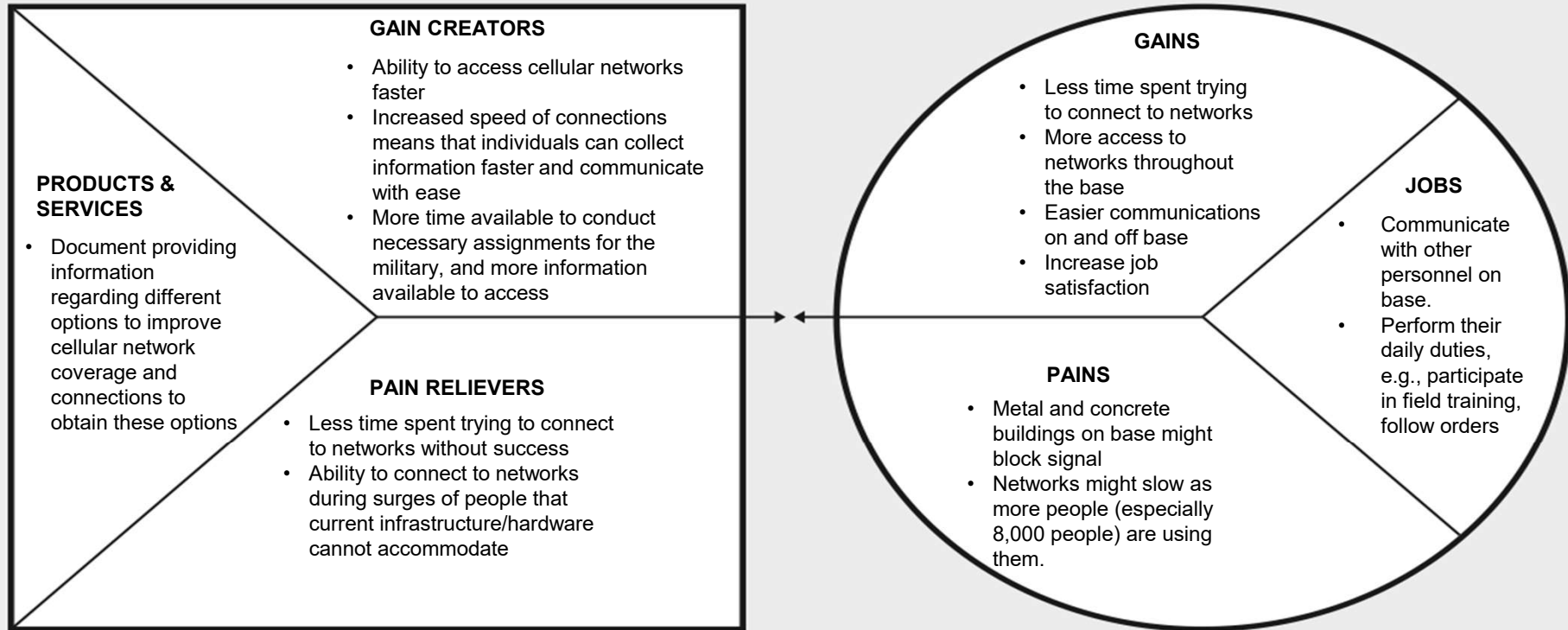
Customer Archetype

- Mr. Mike Stand
- Male
- 27 years old, married to Amy Stand, father to 2 children
- Camp Shelby, Hattiesburg MS
- Army Specialist
- Enjoys hunting and cooking with wife and children
- Must ensure that certain soldiers are completing their duties and communicate with individuals to carry out tasks.
- Requires fast communications (in-person or through a device) and stable access to information.

The Value Proposition Canvas

Increased Cellular Network Access to Improve Communications

Camp Shelby Personnel Participating in Field Training





Customer Archetype

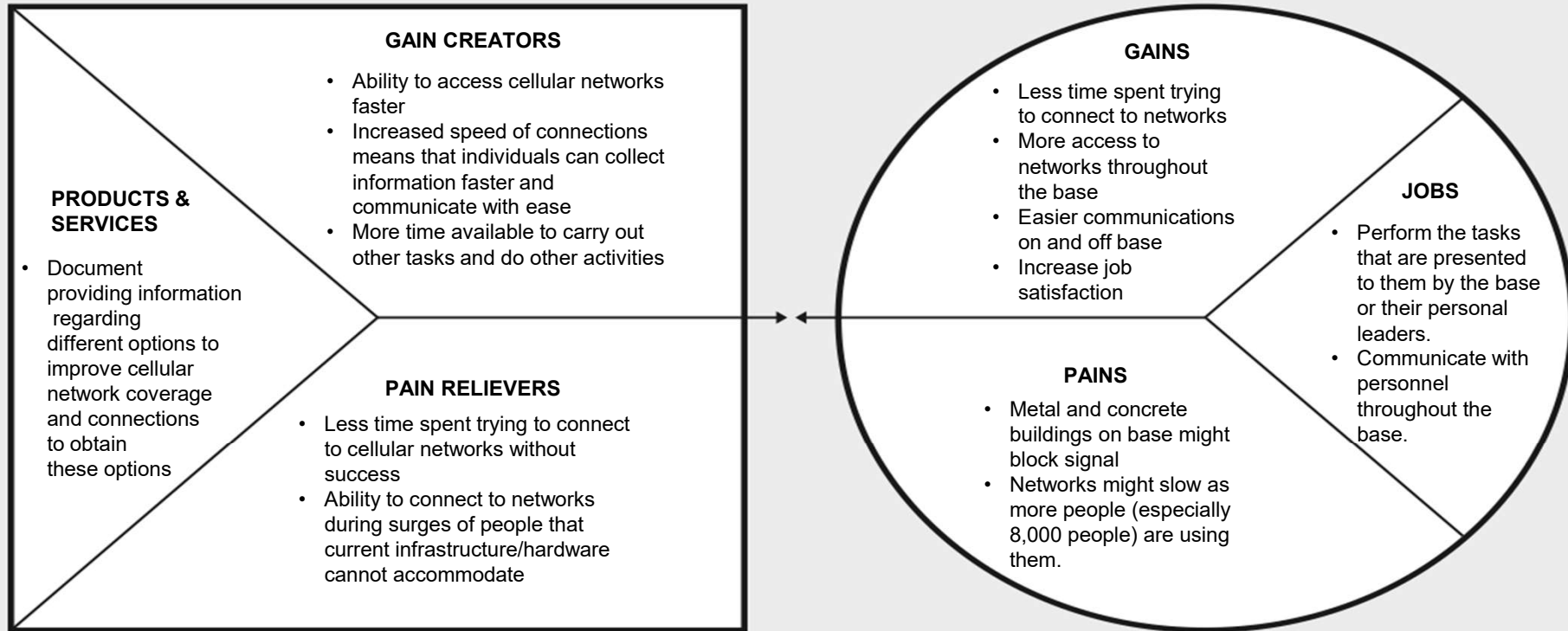
- Ms. Hanna Solo and Mrs. Iva Rich
- Females
- 30 years old and 27 years old, Mrs. Rich is married to Ian Rich
- In Camp Shelby, Hattiesburg MS for training
- Ms. Solo is an army medic. Mrs. Rich is an army specialist.
- Must communicate with other employees and access customer information to complete job-related tasks.
- Requires strong cellular connection and/or access to phone data.

The Value Proposition Canvas



Increased Cellular Network Access to Improve Communications

Visitors Participating in Field Training



Customer Archetype

- Mrs. Robyn D. Banks-Good
- Female
- 36 years old, married to Otis R. Banks-Good, mother of 1 child
- Camp Shelby, Hattiesburg MS
- Teller at Camp Shelby Federal Credit Union
- Must communicate with other employees and access customer information to complete job-related tasks.
- Requires strong internet connection and/or access to phone data.

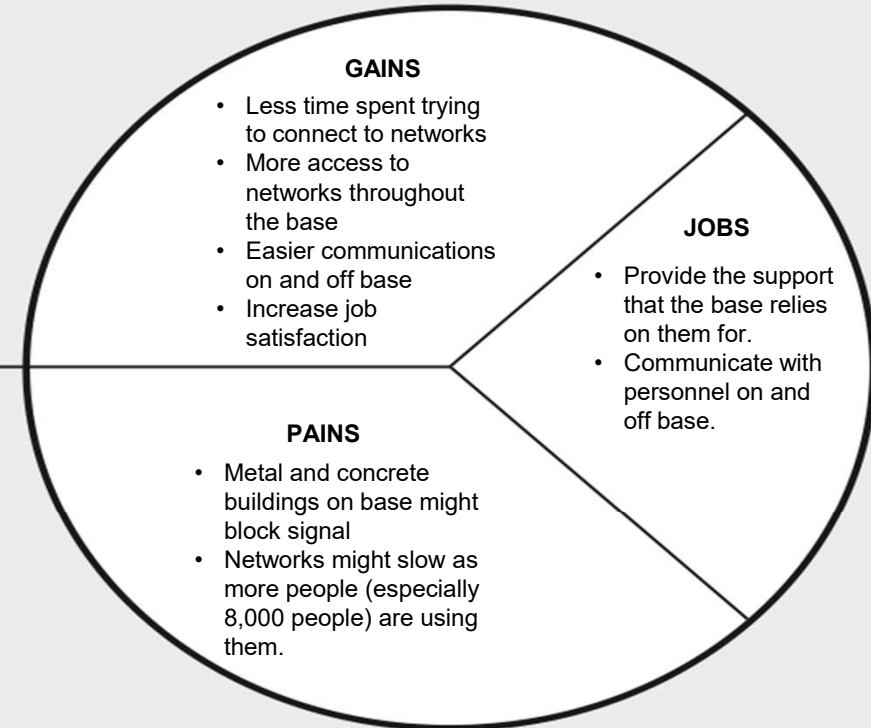
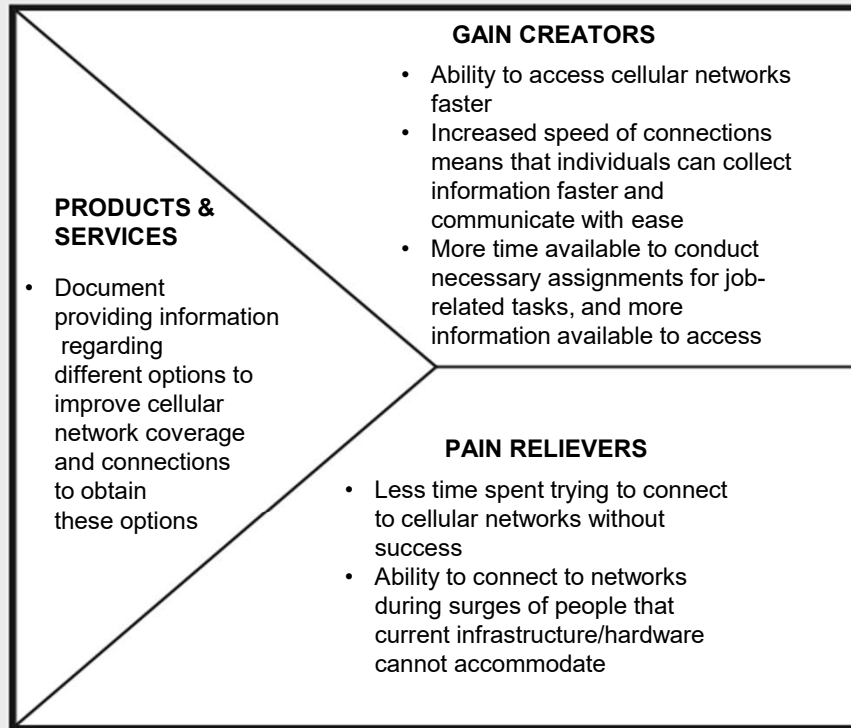


The Value Proposition Canvas



Increased Cellular Network Access to Improve Communications

Employees of Organizations in Residence





Customer Archetype

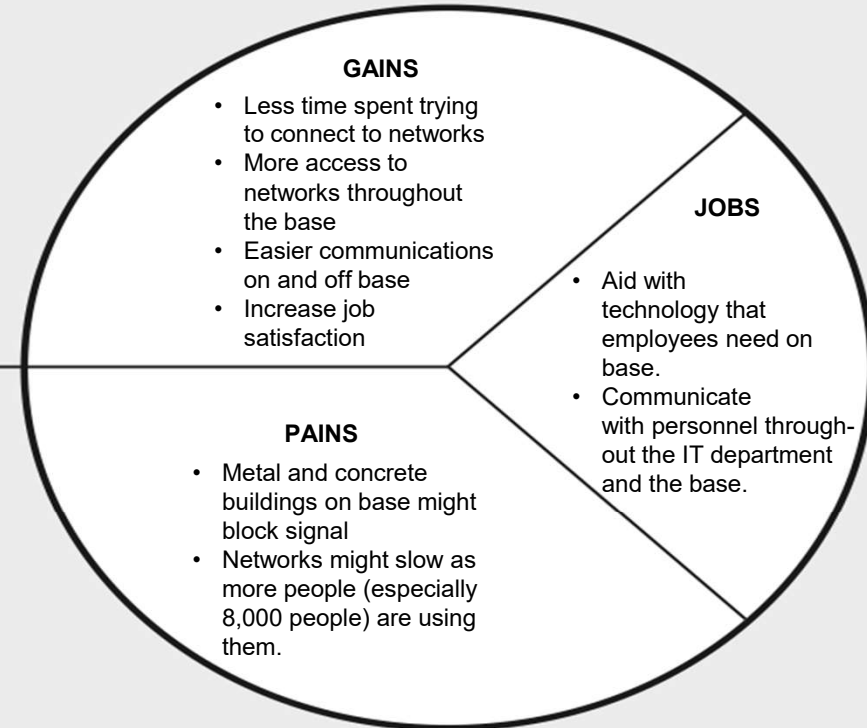
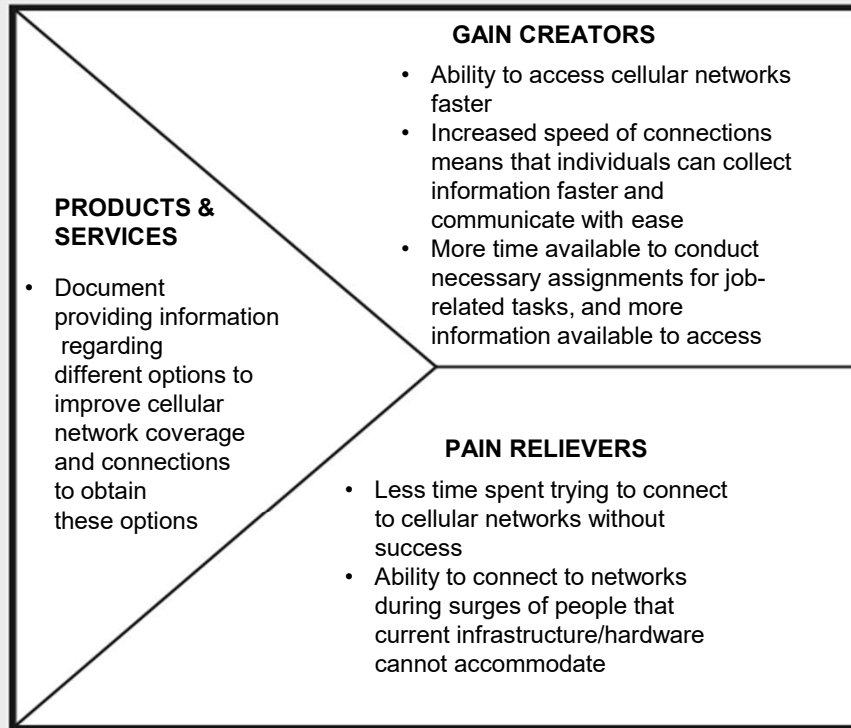
- Mr. Chris P. Bacon
- Male
- 29 years old
- Camp Shelby, Hattiesburg MS
- IT Supervisor
- Must communicate with other employees and access information, databases, and necessary online resources.
- Requires strong internet connection and/or access to phone data.

The Value Proposition Canvas

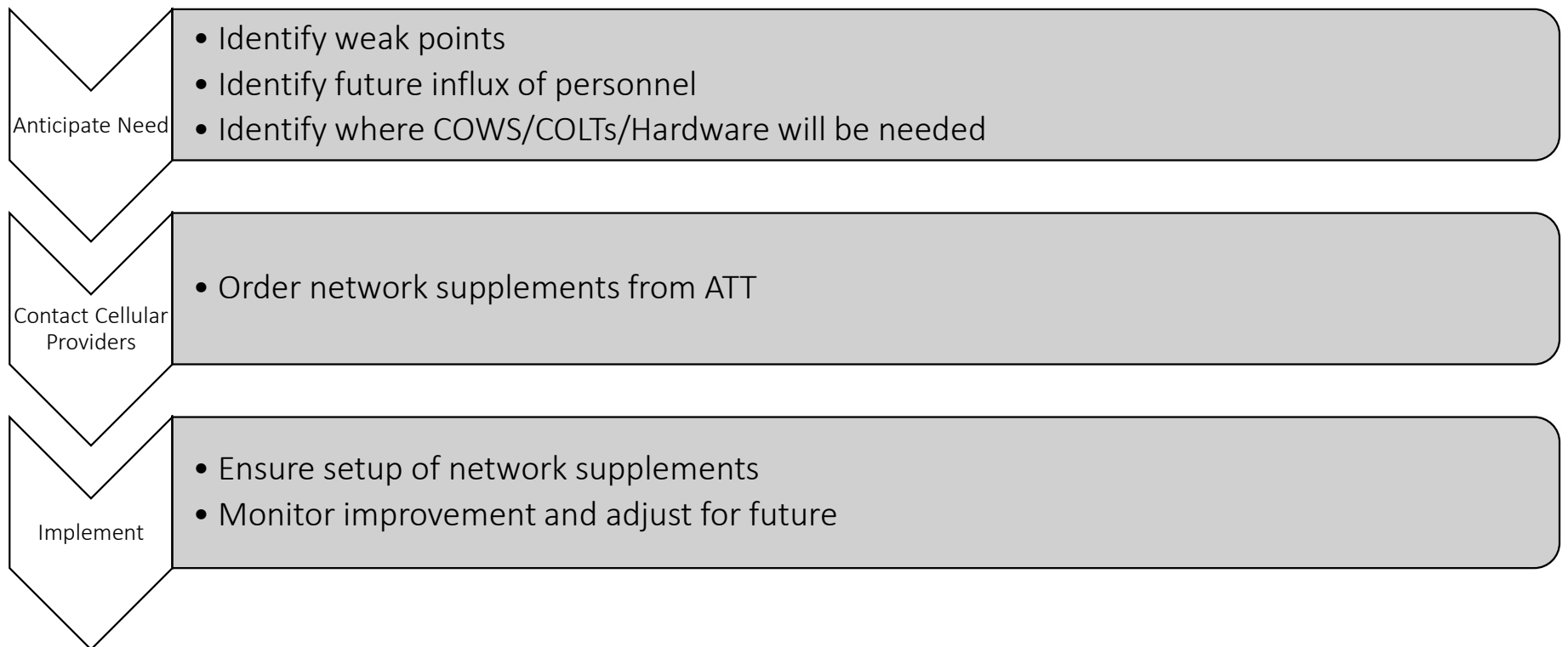


Increased Cellular Network Access to Improve Communications

Camp Shelby IT Personnel



Customer Workflow: COWs/COLTs/Hardware



Mission Achievement/Success

Camp Shelby Leadership -

Decision makers will be able to look at a single document that outlines potential plans of action and their respective strengths.

Camp Shelby Personnel

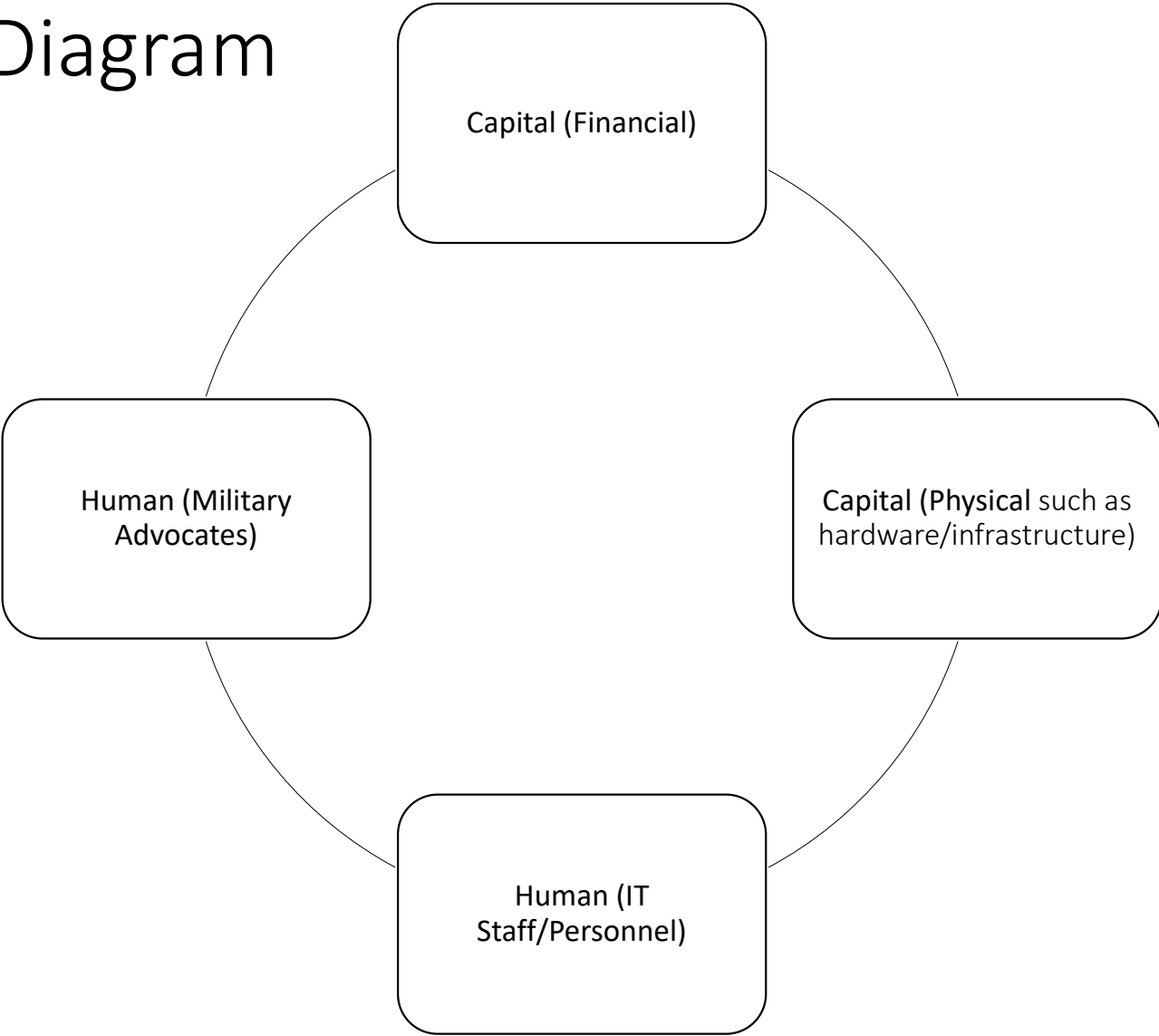
Provided with contact information for leads within the industry that can be contacted when implementing any of the potential decisions.



Key Resources

- IT Staff/Personnel (**Human**)
 - There must be proper numbers of IT Staff/Personnel to maintain equipment.
- Military Advocates (**Human**)
 - It is necessary to be able to work with external organizations to acquire
 - product information and be able to arrange pricing and delivery
 - of necessary products.
 - This involves having military advocates from the private sector, along with researchers such as professors and other workers in the public sector.
- Capital (**Financial and Physical**)
 - Finances and proper funding are essential to make investments that will provide proper hardware/infrastructure.
 - Funding should be allocated towards the proper training of IT Staff/Personnel.
 - There should be funding for future research on improving and maintaining
 - cellular networks on base.

Key Resources Diagram



Key Activities



Discover who could be financial providers/the budget of the whole project.



Communicate with those who have expertise in cellular connection and network activities, especially the ones who mainly deal different types of infrastructures.



Locate where Camp Shelby needs their additional infrastructures implemented on the base, if that is what is needed.

Key Partners

Camp Shelby Leadership

- Any proposed solution will need the full support of Command Post and the IT Supervisor.

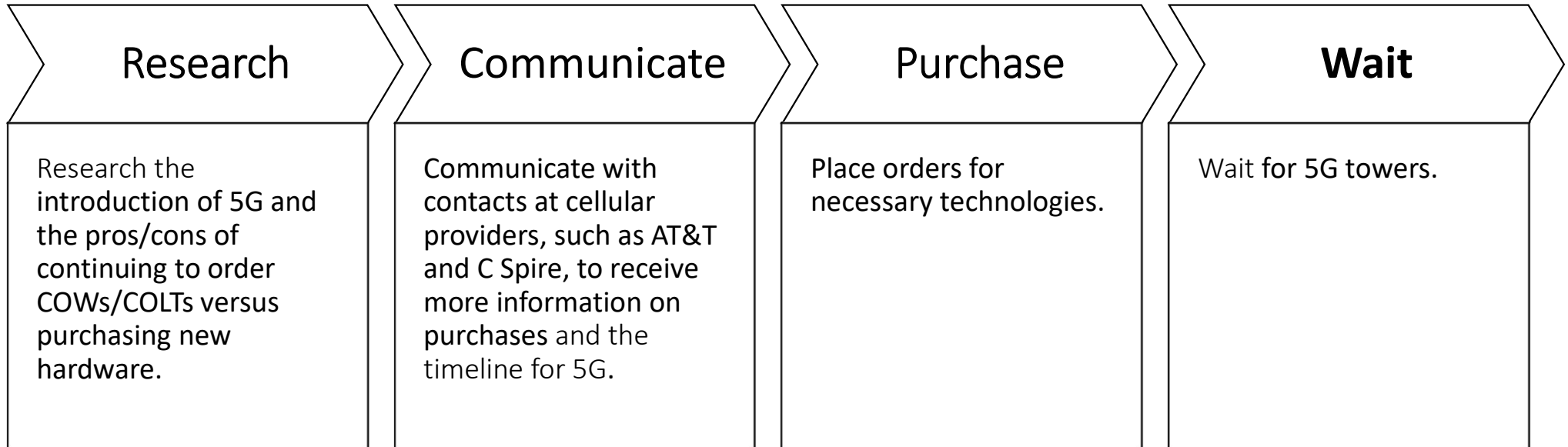
Private Sector Entities

- Outside companies such as cellular providers, infrastructure providers, etc. Will be needed for various tasks depending on final product of MVP.

State or DoD Contractors

- Any current State or Department of Defense contracts must be honored, such as the State-level AT&T contract for COW provision.

Deployment Diagram



Acquisition, Funding and Deployment Timeline

Near future

- Orders can be placed through AT&T and C Spire for COWs/COLTs/additional hardware.
- This can be financed through Camp Shelby's budget or through the private companies.

Far future

- 5G will potentially be introduced to the surrounding area of Camp Shelby around 2021 (This is tentative).
- Federal funding will be used to support the introduction and expansion of 5G.