**Aalto University - Department of Communications and Networking**

**ELEC-E7830 Value Network Design for Internet Services**

**Case JoikuSpot: Effortless Wi-Fi Sharing and Spotting**

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# Abstract

Today people live in the world, where mobile devices are an integral part of daily lives, thus data usage is growing exponentially. This presents challenges to operators and IT companies to offer their communication and digital services both cheaply and with acceptable quality globally, especially for mobile data users. Pricing, data gap and coverage issues has led for an increasing demand of the free or competitively priced public Wi-Fis around the globe, while at the same time the penetration of free Wi-Fi spots has also increased via businesses wanting to lure more customers to their premises via offering free internet connections.

Our case company’s plan is to develop easy to use application to facilitate finding and sharing of good quality public or private Wi-Fi spots and in the same time leverage the collected data from the user’s devices and Wi-Fi-spots to aid smart promotion and customer analysis.

In this report, we will explain and use scenario planning, value network configurations and STOF-method to analyze the current situation of our case company and construct plausible scenarios for the future their services and business in general. Finally, based on our analysis, we’ll offer our recommendations to our case company.

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# Introduction

People are more and more rely on the mobile device nowadays, in the past people watch news on newspaper and computer, watch videos and browse social media also on computer, but now they do all the things on mobile device. (The Broadband Commission for Digital Development 2015, p. 15) Such high demand on mobile device cause the heavy need for mobile data usage, that is also one reason that cellular network has evolved every short period. Together with that, Wi-Fi also plays an important role today. Due to the reason that mobile data usage is relevant expensive than Wi-Fi and there is a limit cap for the usage every month, people are more willing to use Wi-Fi when watch video or download things in public place, and the need is still growing.

That is the business for our case company, Joikuspot, its aim is to develop an application that will help users to find and share good quality of free Wi-Fi. So in this report, we will introduce three methods that will help us to analysis the market and foreground, the value network it can construct and the different aspects of the business potential of our case company.

The report contains short description of methods we use to analysis our case company. Scenarios planning used to analysis the possible foreground of our case company, and choose the most desirable one as our scenario. Next use the value network configurations method to build the value network based on the chosen scenario. Last use the STOF model, service domain, technology domain, organization domain and finance domain to fully view our case company. In the end we will make a conclusion and our recommendation to the case company.

# Methods

In the analysis we used different methods which are described in this chapter. In the following chapters each method are analyzed separately. We used methods like scenario analysis (Schoemaker, 1995), value network analysis (e.g., Casey et al., 2010) and the STOF model (Bouwman et al., 2008).

## Scenario analysis

Scenario planning is a disciplined method for imagining the possible futures that a company will be involved, what the company will be like under different possible futures. By creating a matrix to set up the initial scenarios, every single scenario will contain one environment and the content will be the status in that environment, based on that, some quantitative models can be built to help analysis. (Schoemaker, 1995)

There are ten steps to develop the scenario planning. The first step is to define the time frame for the company plan and scope. Next is to pick up all the major stakeholders, any group that will affect the product will be the stakeholders, so it can be the customers for the product, competitors, employees in the company, shareholders, and investors for the company. Then is to identify the basic trends that related to the company, what will the environment and situation be like within given time frame, is there some variables will influence the strategy of the company. Then is to identify the key uncertainties, this is one of the key steps to building the scenario planning, what kind of events will definitely influence the company, what will the consequence for those uncertainties. Next, you can construct the initial scenario themes, based on the trends and uncertainties you choose for the company.

The last five steps are not included in this report. So in general, the scenarios should contain a large range of possibilities as possible, and concentrate on the inside logic under each scenario. The scenario planning is quite important in the early stage because the value network configurations (VNC) and STOF model are based on it.

## VNC

## STOF model

STOF method (Bouwman et al., 2008) is used to tell how company is creating and capturing value from innovations. Business model describes four domains: Service, Technology, Organization and Financial. Method helps solving the question if the specific business idea viable and usable.

Basically, service domain tells service offering, value proposition and target group. Technology domain is for describing technological functionality for the service offering. Organizational domain concentrates on networks and organizational partners. Financial domain focus in revenues, costs and other benefits in the network.

STOF method goes through different steps as seen in figure 1. It begins with an idea and in order goes to basic questions in quick scan, critical success factors, critical design issues and other issues. In each step all four domains have to be discussed. All steps are separated in own chapters to describe all four domains.

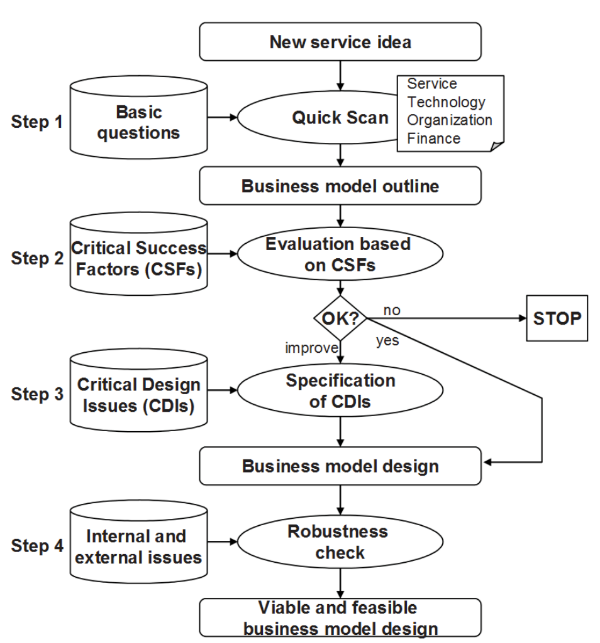


Figure 1: STOF method

# Case description

Our case company is JoikuSpot. JoikuSpot have developed application JoikuSpot Wi-Fi, which we are analyzing. Joiku is known brand from earlier application which was created to share mobile data connection through Wi-Fi. In these days every smartphone have that option implemented inside the operating system and previous application has no extra value to customer. JoikuSpot Wi-Fi enables another missing feature to phone. With it user can find Wi-Fi connection using the map and navigation. User can choose the well known and working Wi-Fi with application, navigate closer and connect to it. Application has sharing possibilities so that when user logs in to Wi-Fi network with correct password, he can share the knowledge of the good Wi-Fi with password. Next user knows the Wi-Fi works well and there is password given by JoikuSpot Wi-Fi. Each time application asks if user wants or doesn't want to share the password. There are also other sharing possibilities in the application, which are not yet in used in common operating systems.

JoikuSpot Wi-Fi doesn't show any ads straight to user. Revenues can be done when user connects to network and opens the browser through the application and clicks advertisement. There have to be about one million users to be profitable. In Finland we have mostly unlimited mobile data connections while in the other countries people need to use Wi-Fi much more often. However, sharing possibilities may become popular in Finland.

Not every business can be distributed all over the world that easily. Android application market called Google Play Shop. There can be millions of users with an application which is created only once and maintained all the time. New user doesn't cost basically anything to JoikuSpot. Huge base of users gives great revenues through advertisements, but at first the application has to be very good and valuable to user. They heading straight to whole world, not just in Finland. There are competitors in the Play Shop, which have very much Wi-Fi data collected from the users. The main difference to others is how to show Wi-Fi quality to users. Wi-Fi sharing is not yet used by the competitors.

# Scenario planning

## Scope and major stakeholders

The time frame for our case company is five years, due to the reason that there is uncertainty for the development of 5G, the impact might cause to the Wi-Fi. The scope is to create a profitable mobile application within the given time frame.

Major stakeholders including first Wi-Fi device users, because right now the application is Android based, so Android users are the primary target. Then there are also digital development platform owners like Apple and Google, operators around the world, venue owners and investors.

The market of the application is worldwide, anyplace people wants to use free and high-quality Wi-Fi, the application of our case company can be used. But there also exists some exceptions, Finland is not a quite good market although the case company is from Finland, because the data package is so cheap while the speed is also fast, so the need is not eager in Finland.

## Key Trends

Here are few key trends in the related fields that relevant to our application.

***Data usage is still growing exponentially.***

It is obvious that nowadays people spend more and more time surfing the Internet via mobile phone and tablet rather than PC and laptop. People use the mobile device to watch the news, check the email, browse the social media app, listen to music and watch video and so on, thus the data usage is growing bigger and bigger, there is a cap for the data usage in the majority of the countries, thus it becomes important for the users to find a free Wi-Fi at outside, this makes the use of our application reasonable.

***Resource limitations are growing problem.***

It is the common sense that to find a new spectrum band for mobile networks and Wi-Fi and use for the data transmission is quite hard. So it is relevant easy to maximize and optimize the exist technologies, make the most use of Wi-Fi is one of the solution, on the application layer, make more people use free Wi-Fi is one of the aim.

***Growing markets have problems to increase the network coverage fast enough*.**

In those developing countries, the deployment of the base station is not easy, a lot of estimation and analysis need to be done before set up a base station, but to create a Wi-Fi spot is relevant easy, thus there is a market for our application.

***Mobile roaming still relatively expensive.***

Whether go travel or business to another country, you either pay more money for the data roaming fee or buy a local sim card, either way, you need to pay for extra money on it. Free Wi-Fi is one solution, our application starts to support free Wi-Fi spots outside the country, it is a quite convenient function while you are abroad.

***Wi-Fi is spreading fast and relatively cheap.***

Most of the Wi-Fi is free, some of them controlled by the operators, you need to pay some money or become a member to enjoy their Wi-Fi service. While you are searching Wi-Fi via mobile device, either the Wi-Fi cannot be connected or there is a password needed although it said free Wi-Fi. Unlike the competitors, our application can help user find the good quality free Wi-Fi, all you need to do is search and connect and enjoy the Internet.

***The culture of sharing.***

Under the present circumstance, people are more and more likely to share their daily life to others, pictures, videos, a lot of things. Besides public Wi-Fi, our application encourage user to share their personal Wi-Fi or other public free Wi-Fi with high quality to other users. On the one hand, this will help our case company save a lot time and energy to find free Wi-Fi on their own, on the other hand it will speed up the widely use of the free Wi-Fi to our customers.

## Key uncertainties

Here list the main possible key uncertainties for our case company

***How to differentiate the service?***

There are already a lot of similar applications that can find free Wi-Fi on the market, such as Fon (<http://www.fon.com>) or Google Project Fi (<https://fi.google.com/about/>) and they already had stable user base. So at this stage, how our application can differentiate with others is a key point because its decide whether the application can success or not. Our case company is quite confident because they are proud of its aim, offer the good quality free Wi-Fi connection, only find the best quality Wi-Fi for users, unlike others only find the surrounding Wi-Fi, which in general is bad because either the Wi-Fi is with bad quality to influence the user experience or cannot even connected.

***What will Google (or any large IT company or carrier) do?***

Some big companies have their plan to offer the free Wi-Fi service. For example, Google right now is testing its Google Loon project, the aim is to launch a balloon and deploy its as a network hotspot, to offer the cheap and stable network service for developing countries. Also Google has launched earlier mentioned Project Fi service, that aims to provide easy and reliable paid Wi-Fi experience across continental US for premium Android phone users, in conjunction with carriers, hardware makers and users. For our case company to succeed against this kind of competition, they must offer superior user experience and look for new and unorthodox ways to add and monetize the value provided by the offered service.

***Future of Wi-Fi access?***

Will Wi-Fi be replaced by other new technology, or even by 5G that plans to deploy in 2020? The development of 5G is still under process, it is sure that 5G will bring high speed and big bandwidth, either way, if the price is low, it will become the potential killer to Wi-Fi. But it seems that our case company is not worried about it, because the application will launch late this year and time frame is 5 years, they are pretty sure that at least within 5 years, Wi-Fi will still play an important role in data connection.

***How will operators react?***

More and more free Wi-Fi will cause thread to operators, if the impact cannot be tolerant, they will make some move. The application of our case company has published its beta test version on the market, according to the feedback, there are already some users with the same operator reflect that some of the function can not be used, and it is not the bug of the application. So there might be a negotiation with operators.

***How to achieve critical mass of users (ca. 1 million)?***

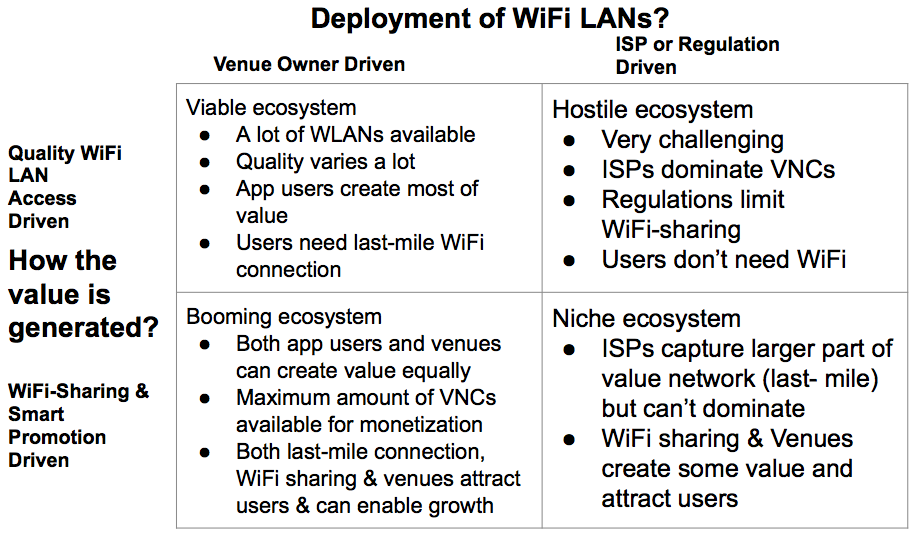
Nowadays’ environment, if your application is not attractive enough, it will disappear in a very short time, so the high quality of the application with attractive function and keep update based on the feedback and the trend of the environment is the key. On the other hand, our case company is well known by the Symbian time, so the brand was known by some users, it is optimistic to achieve the goal.

***What are the main generators for revenue?***

The aim for the beginning is to gain the user base, but after that, it must think of some ways to gain revenue to keep the company running. Embed smart promotion from advertising but without shown on the user interface and sudden notification, there is no ads directly in the application. Then is to corporate with the venue owners to discuss about the business to find out a win-win situation.

## Initial scenarios

Scenarios are based on the most relevant key uncertainties, under the situation of our case company, we choose “deployment of Wi-Fi LANs?” and “how to value is generated?” as our x-axis and y-axis to build our scenarios. There are two options for the deployment of Wi-Fi LANs, either by venue owner driven or Internet service provider and regulation driven. the value generation also has two options, quality Wi-Fi LAN access driven or the Wi-Fi-sharing and smart promotion driven. Figure 2 shows the initial scenarios matrix, thus four different scenarios have shown below, viable ecosystem, booming ecosystem, hostile ecosystem and niche ecosystem.



**Figure 2. Initial scenarios**

The best initial scenario for our case company is the viable ecosystem. Under this ecosystem, based on the high quality of Wi-Fi share, a lot of free Wi-Fi can be used by our application, thus the quantity is considerable, and quality varies a lot, application users will create most of the value and the application can spread fast. A middle term plan for our case company is based on the viable ecosystem. A large user base can help our case company step into the booming ecosystem, under this scenario, our case company will gain benefit most by using the strategy of smart promotion, both application users and venues can create value equally.

But if the deployment of Wi-Fi is under the ISP driven, scenarios will not benefit for our case company, it will be very challenging. Internet service providers will dominate the market, and free Wi-Fi will be limited and some regulations by the ISP must limit the function for Wi-Fi-sharing. If the price of the data package is attractive, users do not need Wi-Fi anymore. Last one is the niche ecosystem, there is no doubt that ISPs will capture the most part of the value network, but there is still market for the Wi-Fi, and it can create some value and attract some users.

# Value Network Configurations

The analyzed VNCs are based on the survey of technology domain presented in the Diagram 1. below. Note: Protocol names are removed from some of the diagrams for clarity, refer Diagram 1 for protocol insights.

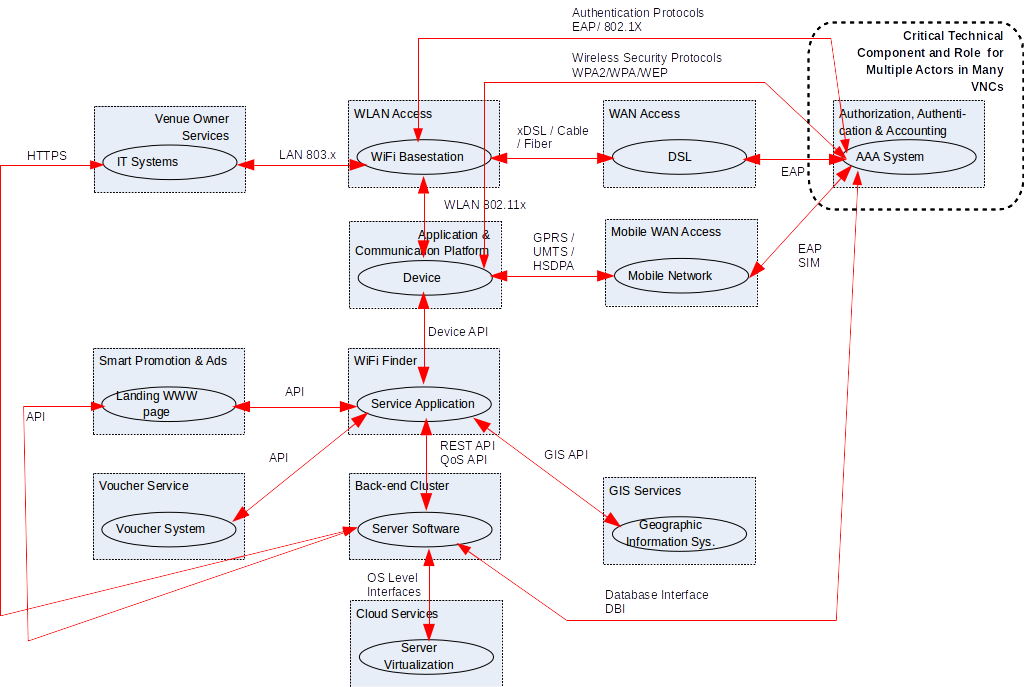


Diagram Technolgy Domain

Following three VNCs were chosen from our analysis, since they present the core of current offer and also show opportunities to expand and develop VNCs further. The first VNC below describes the one possible configuration, where user needs drive the forming of business deals between the actors. The user uses customer app to spot free and good quality Wi-Fis, and pays for customized additional services such as localized country level offline Wi-Fi spot location maps. The monetization is from the advertisement services displayed and used via Wi-Fi spotting and sharing app.

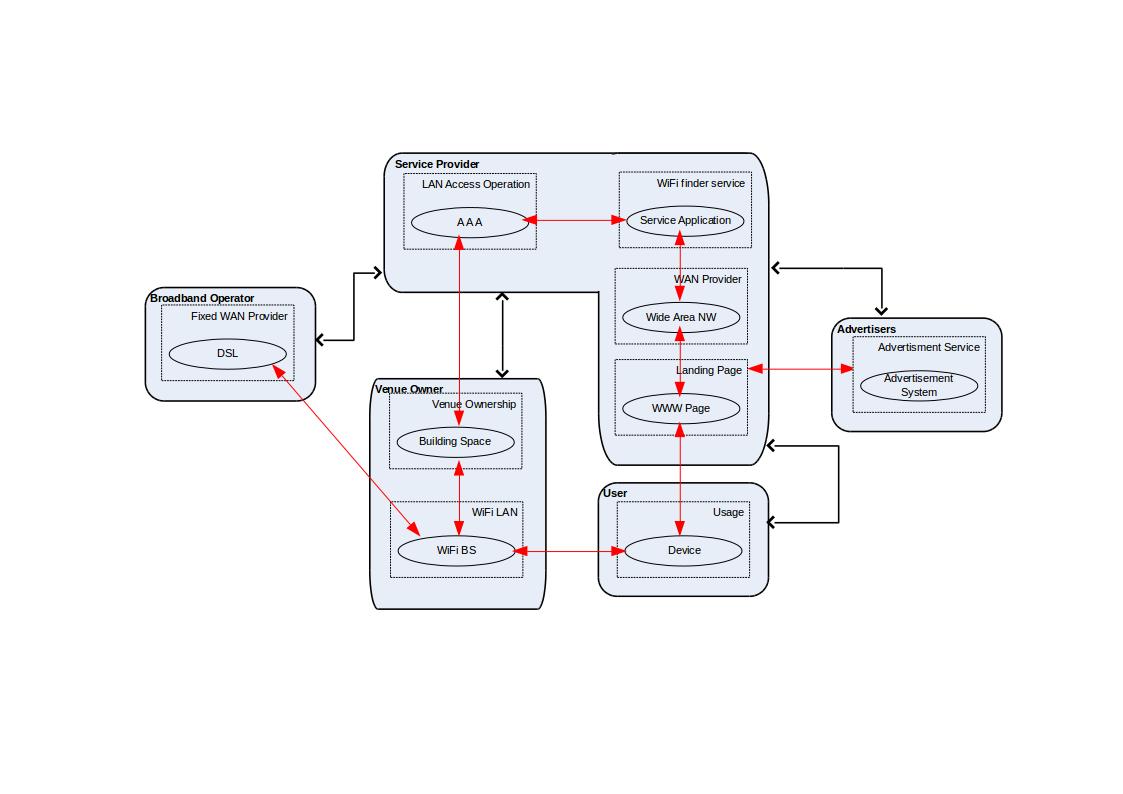
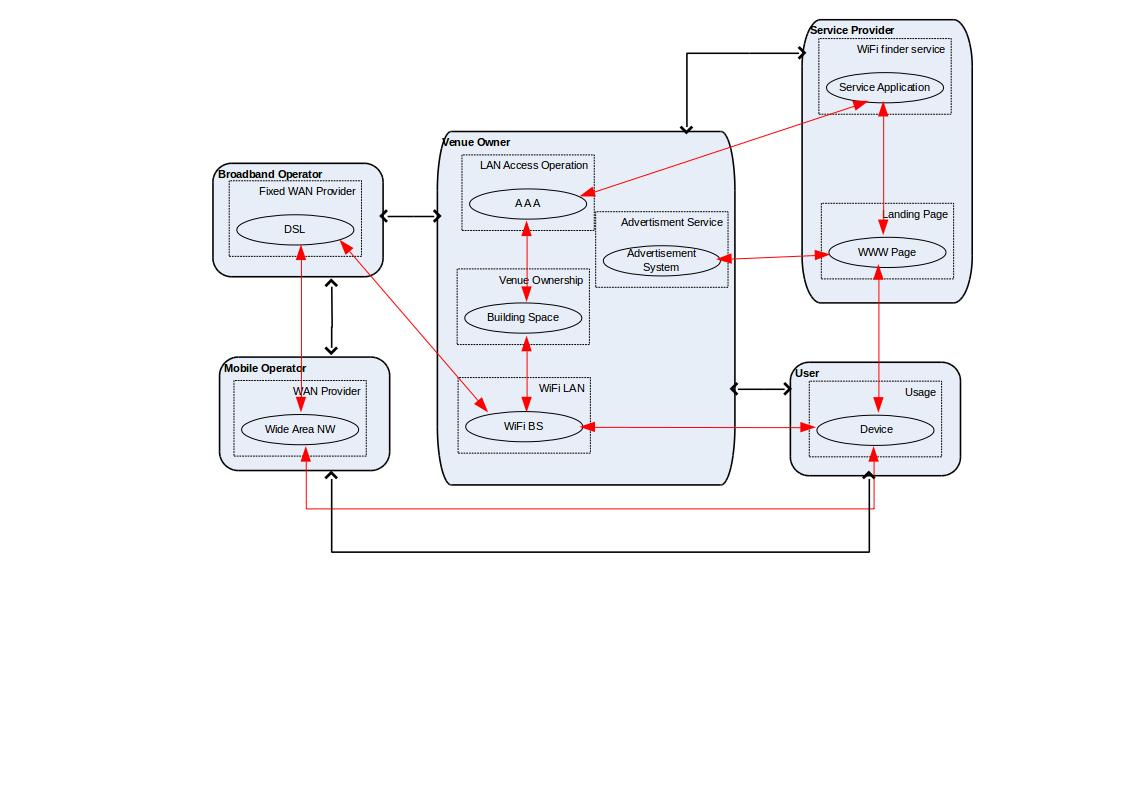


Diagram Device Owner Driven VNC

The Diagram 3 below shows the value configuration network from the view of the venue owner, where value is created for venue owner via customized smart promotion services and monetization for our customer consist of creating this advertisement channel and analytics for the primary customer (the venue owner). The role of device user is to provide valuable information and potential sales for the venue owner and the added value of our customer app is to entice the app user to visit the venue owner’s services and be potential paying customers for venue owners.



**Diagram 3 Venue Owner Driven VNC**

Diagram 4 below shows the most complex VNC developed for the case, where both advertisement (smart promotion) and Wi-Fi sharing angles are taken into account. Via combining the both of the opportunities, this value network shows the potential of combining multiple value networks for multifaceted network of technologies, roles and actors. The one critical component is different authentication methods and technologies used. The easier it is to share Wi-Fi networks securely, the more value users and venue owners (or Wi-Fi sharers) will be exchanged. To tap into this value exchange, our customer can leverage multiple different technologies in the future and currently implemented features already offer very good basic set of secure sharing options.

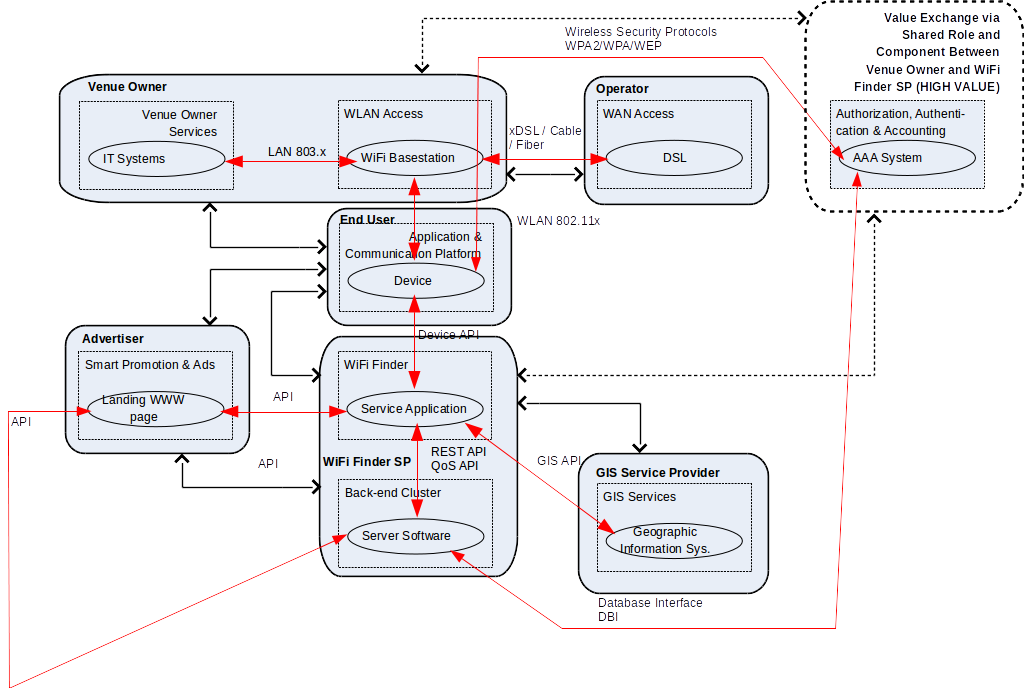


Diagram Advertisiment and Sharing Based VNC

# STOF model

## Quick Scan

At first domains are challenging company to answer basic questions in the first part.

Service domain: Service concept is to offer free Wi-Fi sharing and finding possibilities. Target group is smart phone users and at first specifically Android users. Value proposition is to offer free application with easy Wi-Fi sharing options and target quality over quantity. Company is quite well-known by its earlier applications and they have trust by lots of people. They can base their value throughout these reasons. Customer may have great advantage with application when finding free and working Wi-Fi while no other software is offering quality.

Technology domain: Main technology is the application with online maps. The application uses mobile data and Wi-Fi options. Operating system causes limitations, because there are others than Android. If features are built in the Android, application becomes useless. Operators may also block some of the Wi-Fi features on the phones, but it is not used widely. Becoming 5G is not yet either limitation or benefit, while company is trying to earn value at this moment in this kind of situation.

Organization domain: Company has a small core group developing the application and few investors supporting them. They are buying some options from third parties like maps, servers and distribution. These are usually bought this way when developing phone applications and it is much more cheaper and efficient than doing by itself.

Financial domain: Company can earn revenues when having active users. Risks are mainly very low. They don’t need to spend money before they earn it. Company is planning to reach break-point within one year. They also have multiple possibilities of revenue sources and they can change it with careful movements. They can earn revenues very fast after application is launched. Company have earlier knowledge of pricing and customers willingness to pay different opportunities. Their principle is to create free application without ads and collect revenue other way.

## Critical Success Factors (CSF)

CFSs evaluate if the business model is capable for both customer and network value. This step improves earlier versions of business model. For customer value company is offering compelling value proposition by “Good quality Wi-Fi with easy access and flexible ways to share” and defining target group in Android users using Wi-Fi. Customer can see also valuable and working application with fast downloads and reliable data. Customer retention and acceptable quality of service are captured with the application for a good reason.

CSFs for network value are acceptable profitability, acceptable risks, sustainable network strategy and acceptable division of roles. Profitability is acceptable if application can make profit and reach break-point within one year. Costs are not growing as much as revenues. Revenue sources still need to be clarified more clearly. Risks are basically how well company can earn money and how fast. Investors and own capital is used to built the application. In the worst case all money and working places are gone, but there is much to do before that point. Network strategy is clear. Company has partners with geographic information service providers, voucher service providers, point-of-sales system integrators, venue owners and investors. Only Android application shop is not easy to change. Division of roles is also clear while application is own.

## Critical Design Issues (CDI)

This step makes an iterative process together with CSF. Success factors are acceptable, but there is some work and decisions to do in the company.

CDIs are separated in domains which are shown in the tables below. Tables explain the most critical questions based on the method.

**Service**

|  |  |
| --- | --- |
| **Targeting** | Application is for all Android users for finding and sharing Wi-Fi all over the world. |
| **Creating value for end user** | There is no other application sharing and finding Wi-Fi with security and quality. Users may find these features usable. |
| **Branding and trust** | Company is already known from earlier applications and it will help it to grow once again. |
| **Customer retention** | Application informs and gives notifications based on user needs, which gives user a reason to keep the application in use all the time |

**Technology**

|  |  |
| --- | --- |
| **Security** | Passwords are not shared directly and it is more secure way of sharing |
| **QoS** | Application needs to work perfectly before launch to get trust from the users |
| **System integration** | Easy to integrate 3rd party solutions in the application |
| **Accessibility** | Open API system |
| **Management of user profiles** | User data can be used beforehand |

**Organization**

|  |  |
| --- | --- |
| **Partner selection** | Price reasonable partners chosen |
| **Network openness** | Venue owners can be partners |
| **Network complexity** | Organizational part is not complex |

**Financial**

|  |  |
| --- | --- |
| **Pricing** | Knowledge from earlier applications. Environment has changed in 5-10 years and company might face challenges and surprises with pricing. They know what kind of possibilities people are willing to pay and how. |
| **Investments** | Company have got investments and they are still looking for business angels. They need money to create application better and quicker. |
| **Division and valuation between network actors** | Company basically collects the profit while costs stays in reasonable low level or grows reasonably |

## Robustness check

The last check answers final questions of the business model design. This part concludes the model started in quick scan in four points: internal validity, predictive validity, robustness and adaptability.

Internal validity answers is the service doing the expected task. Company have already designed and implemented more features to application to make it better. Service is doing what it is expected to do. End user can find, connect and share Wi-Fi connection.

Predictive validity asks does the service actually deliver value to end customer and by judging the beta version, the app is good enough to deliver the value for both end users and venue owners.

Robustness challenges company to cope with changes. In short term, the environment will not change. Mobile applications living time is not very long and there is risks of changes in the future.

Adaptability can be seen in smart promotion and other ability to adapt to changes. Company can create more features to capture value inside the same application. In the future they have collected much data from the users.

# Conclusions and Recommendations

The key conclusions and recommendations based on the study can be summarized under following topics.

## Develop the application fast

Move from beta to launch as soon as possible. This view is supported by the seemingly fast deployment of new competitive services (e.g. Wi-FiUnited) [[1]](#footnote-2) and the seemingly good quality beta-software and launch plan. Currently launch is planned on the beginning of the May 2016, which based on our analysis is a viable goal.

## Go big or Go home

Our customer should aim to build a platform of services, not only a simple service aiming to find good quality Wi-Fi networks. One good opportunity is the sharing angle, where there are possibilities to create self-reinforcing cycles of user acquisition via people and organization using our customer’s app and service to share the Wi-Fi passkeys to their visitors and customers and bringing this way droves of new users for our customer’s service.

## Prioritize the easy and secure sharing of Wi-Fi passkeys

One of key features to enable the creation of a platform type of business and prominent connector of technology components in all of the relevant value network configurations, the easy and secure sharing of Wi-Fi passkeys is at the moment one of the unique differentiators of case company’s application services.

The additional value network configurations offered and the ecosystem created by smart sharing could enable disruptive change in the market and usage and sharing of Wi-Fi networks globally. The value added by smart sharing is applicable to all markets from developed countries to developing economies.

In addition, the security of Wi-Fi and other widely used communication protocols is one of the most current and relevant topics of digitalization of products, services and world societies.

## Manage Resources Smartly

Scale fast employee and service wise. After launch be ready to move other platforms fast and be active collecting potential investors. Scale according the funding received from investors.

## Create something exciting in the app

To enhance the user experience and enticement of the service, develop e.g. gamification of app features, such as awards for people collecting most information about open Wi-Fi spots or most active Wi-Fi sharers (not counting the business sharers here, but rather ordinary consumers).

The discussion of possible “Joiku Points” virtual currency is promising, but our customer should also look into leveraging existing point systems around the world, especially the new crypto currencies such as Bitcoin (<https://bitcoin.org/en/>) could provide interesting monetization opportunities.

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# Feedback for the course

For our group, amount of credits was accurate enough compared to actual work done. The session schedule was suitable, but for future courses you could arrange couple of intermediate DL:s for the project final report. That would give positive pressure to keep the work flowing evenly during the course, and with possible feedback of current project work quality and status, the overall quality of returned projects could improve. Also if possible, provide also LaTeX-template for project work (some free LaTeX online collaboration services are even better than current Microsoft offering).

The methodology learned during course was overall suitable for the case, although some predicted outcomes would have been benefited from more in-depth analysis based on system dynamics approach. Also for this project, the construction of value networks provided some challenges, because of the modelling language’s limitations. Some important parts of value chain value exchange were hard to describe with the current methods symbols and graphs. Certainly some of these problems are ‘known limitations’, but they posed a bit of an issue.

If the course would have more resources, the amount of students applicable for the course could be larger, since this course is definitely one of the most rewarding and practical in current curriculum. The opportunity to make contacts to business for possible summer or thesis work is certainly there, and it seems that if companies are truly invested in supporting the student project work, the business will get good value on invested time and other resources. We think that our case company contact person and CEO is one of the best examples of active tutor and because of this activity, we believe he got good value returned on the time he spent with us discussing and guiding the project work. Course staff could use this as the selling point to the company contact persons to put the required effort to really leverage the work of the students.

1. <https://www.kickstarter.com/projects/640420941/wifiunited-provides-free-wifi-worldwide-to-its-mem?ref=project_tweet> [↑](#footnote-ref-2)