PRD: Li-Fi

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Vision

In this fast-paced tech world where organizations and public crave for faster internet options, we support commercial and residential sectors with next-generation automation i.e. by integrating Li-Fi into their lighting fixture and wearable tech. Li-Fi is a high-speed wireless technology that generates Internet connectivity from lights which are even faster than fiber. Not only this, we provide additional integration in devices specially designed for the commercial sector that enhances phones and lighting infrastructures with access to capabilities of Li-Fi.

Motivation

Most households in the US experience connection or speed issues with broadband connection, while parts of them can't even connect to the WiFi. One's who do not have access to even these, opt for other options, such as satellite or dial-up, but those are generally slower, face larger data caps and are often affected by weather or other interference. According to a report from Education Superhighway, 6.5 million students do not have access to even 25 megabits per second of total bandwidth. But what if there is a way to connect to the internet and benefit from a direct connection with super-fast speed from the comfort of your home or office? **Enter Li-Fi**.

Li-Fi is a breakthrough technology that uses LED lights to provide high-speed Internet connectivity. With Li-Fi, a user can access LED-based wireless access technology that is even faster than fiber. The relatively new access technology is an energy-efficient alternative to cellular mobile networks.

Our company **Li-Fi - New Dimension of Life** felt a need to bring energy saving internet services for the betterment of mother earth. To offer services that are more steady than other conventional methods. Unlike current solutions that use radio transmission, we bring to the table a technology that is energy-efficient, more reliable, interference-free and more secure than cellular or WI-FI.

HOW THIS WORKS

When an electrical current is applied to a LED light bulb a stream of light (photons) is emitted from the bulb. LED bulbs are semiconductor devices, which means that the brightness of the light flowing through them can be changed at extremely high speeds. This allows us to send a signal by modulating the light at different rates. The signal can then be received by a detector which interprets the changes in light intensity (the signal) as data.

The intensity modulation cannot be seen by the human eye, and thus communication is just as seamless as other radio systems, allowing the users to be connected where there is Li-Fi enabled light. Using this technique, data can be transmitted from a LED light bulb at high speeds.

DIFFERENTIATION

We are the first to provide such features in the world.
The competitive analysis chart has highlighted some unique features of our Li-Fi product, which makes our product apart from others present in the market.

- **Speed**
  Our product's indoor speed is around 200Mbps, no other LiFi services provide such speed.
- **Product availability integrated with Li-Fi component**
  We have availability of 90 % products that are integrated with LiFi component
- **Monthly Service Cost**
  We want our customers to benefit from our services. Our monthly service cost is $10 only which is the lowest in the current market.

COMPETITIVE ANALYSIS

Competitive analysis chart:

Competitive Analysis for LiFi Networks									
	Companies								
Factors	**LiFiCity (Our product)**	**fSONA Networks**	**GE**	**Signify**	**pureLiFi**	**Enlighted**	**EVRYTHNG**	**SmartThings**	**LIFX**
Speed (present indoor speed)	200 Mbps	155 Mbps	42 Mbps	30 Mb per second	40Mbps to 250Mbps	50mbps	No Data	No Data	No
Monthly Service cost	$10	NA	NA	NA	NA	NA	NA	NA	NA
Products integrated with LiFi component	90%	60%	60%	60%	70%	50%	60%	70%	80%
Security	yes	yes	yes	yes	yes	yes	No	No	No
Obstacle Interference	yes	yes	yes	yes	yes	yes	yes	yes	yes
Transmit/receive power	yes	yes	yes	yes	yes	yes	no	no	No
Notable Features	Lifi Networks and products	Lifi Networks and products	Lifi Networks and products	Lifi Networks and products	Lifi Networks and products	Lifi Networks and products	Lifi products only	Lifi products only	Lifi products only
Can achieve great Range	yes	yes	yes	yes	yes	yes	only deals with Lifi products	only deals with Lifi products	only deals with Lifi products
DatafoxScore	Not available	Not available	Not available	Not available	837	1019	1023	1007	953
Company based on VLC i.e visible light communication	yes	yes	yes	yes	yes	yes	yes	yes	yes
Funding	$50 Million	$32 Million	$25.9M	$7 million	$14.6+ million	$55.63+ million	$7 million	$15.5 million	$13.32 million
Research & Development	yes	yes	yes	yes	yes	yes	yes	yes	yes
Company features	Li-Fi provides connectivity to users located directly below or across a light source providing an alternative means of connectivity in these types of environments.	fSONA Networks engages in the manufacture of a line of SONAbeam free space optical wireless products for the broadband access market. free space optical wireless communications equipment on the market today.	GE has established its presence in the VLC market with its offerings through the lighting segment. The company offers indoor positioning system. The GE LED lighting fixtures is embedded with indoor location technology. The solution integrates VLC, BLE, and inertial device sensors. It supports iOS and Android applications on smart devices that are equipped with a camera and Bluetooth Smart technology.	Signify (formerly known as Philips Lighting)They are investing heavily in developing LiFi products.	High performance wireless for 5G and beyond. where its pioneering research into visible light communication has been in development since 2008 as part of the renowned D-Light project.	The Enlighted smart sensor network controls light levels	EVRYTHNG is the IoT Smart Products Platform connecting consumer products to the Web and managing real-time data to drive applications and experiences.	SmartThings lets sensors communicate with each other, unlocking a new world of possibilities and resulting in the world's most accessible and advanced open platform for the Internet of Things.	LIFX claims to be the smartest light bulb ever experienced. It's a WiFi-enabled, energy efficient, multi-colored bulb that the user controls with iPhone or Android

Below is the link:
https://drive.google.com/file/d/1uQApqzVWGQdDN9U7-91udNwm6YYbqhol/view?usp=sharing

CUSTOMER SEGMENTS

Initial Target Customers:

Starting to target smaller segments initially only in the Boston area as our funding is limited. Planned to hit the big market as we progress to success and get more funding.

Small Companies:

Companies currently use WiFi for internet connection. There is not enough security in using the WiFi networks as it can be easily hacked. The speed and data transmission are not that great. We will target small companies to make use of our service with LED lights or our hardware products in order to receive great speed and security. Our hypothesis is if this technology and its products are successful in companies, many small companies will approach us to have great speed of internet connectivity, secure and interference-free as its best and more reliable.

Schools:
Students do not want any sort of download issues and problems of connectivity. They need cheaper internet options and are more inclined towards high-speed internet and security. So we are willing to try our services in schools and colleges to see how the reactions are and based on responses of students and school management we can decide the future of Li-Fi and its products. If this works, Li-Fi can reach in many parts of the world in helping increase the literacy rate as schools and students from even remote areas will be connected to the internet and they can benefit the most from it.

Residential citizens:
We are really expecting a lot from this sector. We conducted some interviews with residential citizens so we can analyse what they think about the LED lights as a source of the internet. And are they willing to accept this kind of concept which can be the future. People showed positive response via surveys and interviews and are very much interested in having cheaper internet options from the comfort of their home. Our company is looking forward to experimenting more with this sector.

Future Target Customers:

Our customer segment will be based on huge organizations where the process needs to be faster. We are now reliant on noticeable light from lights and globules. Li-Fi presents numerous phenomenal favorable circumstances for its take-up and uses, the extent that remote Internet availability is concerned. What's more, the motivation behind why Li-Fi innovation is so alluring is its boundless limit of obvious light that is much greater than the radio flag. Additionally, expanding utilization of area-based administration is referred to as a key driver of the Li-Fi advertise. For example, rising interest from end-user enterprises, for example, hospitals, medical centers, and schools will undoubtedly fuel the development of the business amid the evaluation time frame.

UNMET NEEDS

Our company realized there is a need for eco-friendly technology and associated products that in future to permit data transmission which has great speed of internet connectivity, is secure and interference-free and it's best and more reliable.

Reliable Wireless Network for future

Every year world consumes 60% wireless data that uses Spectrum. Radio Frequency spectrum has limited availability in the lower frequency bands of the exponential growth of wireless data traffic and will no longer keep up the demand. This is causing Spectrum Crunch. The world needs another spectrum for future wireless communication systems. This clearly indicates the need to look out for another spectrum alternative that can solve problems related to Spectrum Crunch.

Speed Issues

WiFi and other cellular networks come with various speed issues. The most common problem people face is having a slow connection while networks are bogged down. The farther you are from the router, the slower the connection or connectivity issue. Another could be lack of bandwidth. If the data is shared amongst different family members in a house with a possibility of neighbors stealing the network data usage too, the speed is spread thin and the connection is most likely lost. This calls for a need for wireless radio frequency uninterrupted source.

Security

For hackers, it's very easy to ingest into private networks. Due to which users are losing confidential information including their social security numbers and other personal data. Not only this, these cyber-intruders are capable of stealing the government's data for supplying to terror groups which can be really dangerous for any country. This way, terrorists become aware of any activity taken against them in advance, which they are able to evade easily. Thus, there's a dire need of secured network in the world to avoid all security-related issues.

Hardware Issues

Periodically, hardware systems such as router or modem or big data servers crash due to unexplained reasons. In such a case, retaining the internet back usually takes a lot of time. Due to which key deliverables or deadlines are sometimes missed, for which users have to pay a heavy price. It is costing students a low grade for failure to complete projects or exams on time and companies heavy penalties for not delivering promised deliverables.

EXISTING SOLUTIONS

Today customers rely on WiFi for wireless communication but there are a lot of issues to continue with only WiFi as a reliable wireless communication network.

WiFi the short form of Wireless Fidelity is used for data transmission i.e. internet browsing with the help of WiFi router. It uses electromagnetic waves at radio frequencies. Users can connect their computers, smartphones, or other devices to the Internet or communicate with one another wirelessly within a particular area.

Although this is the most common internet service used in the world. But there are some disadvantages associated with it. Due to radio frequency waves, it cannot be used in a dense environment. There are Interference issues from nearby access points so it cannot even pass seawater plus it is highly unsecured. The radio frequency signal cannot be blocked by the walls and hence there is a need to employ techniques that will provide more secure data.

Cellular Networks

A cellular network is a radio network distributed over land through cells where each cell includes a fixed location transceiver known as a base station. These cells together provide radio coverage over larger geographical areas. User equipment (UE), such as mobile phones. Cellular networks give subscribers advanced features over alternative solutions, including increased capacity, small battery power usage, reduced interference from other signals. Popular cellular technologies include the Global System for Mobile Communication, 3GSM and code division multiple access.

This alternative also has some problems associated too. Users do not sometimes receive a 4G/LTE network. They can't tether the device. And are unable to use more data than allotted. Thus, there is a want and need for a technology that can take care of these issues.

Verbal/Visual Walkthrough of Use Cases

1. **Student:** Aby recently moved to a new off-campus housing along with his friends. All of his friends including him are studying at Harvard Business School. They are looking out for a bunch of wifi options but are not 100% satisfied with any of them. While on campus, the internet was amazing, but they lost connection at times for unknown reasons right before critical deadlines and paid a heavy price in their grades. This is the reason they do not want to risk it this time and reached out to Li-Fi- New Dimension of Life for setting up fastest internet solution which also gives them an option to convert their house in a smart home in future. So, they search online about Li-Fi Services and register themselves through Lificity.

2. **Residential citizens:** Tia is an artistic person and loves to blog on Health and Life from the comfort of her home. She hates data crashes. She is always eager to learn something new and works on dozens of projects for renowned magazine covers. Reasons for her to

move to Li-Fi technology is because of slow download times, unable to connect to smart devices, slow uploads, slow shutter speed, data crashes, internet connection issue.

3. **Small companies:** Aaron is a software engineer in a Boston local software company. His job is to maintain an application which has a huge number of users with their profiles. Since Aaron works on maintaining the application, it's important to update the code timely. But recently, the Wi-Fi broke down very often, his working efficiency is influenced, and he feels that it's hard to focus on the coding. A week ago, the user's data was stolen by a group of hackers, the user's privacy was affected. This is the reason they want to try out new technology i.e., Li-Fi technology.

They follow these steps:

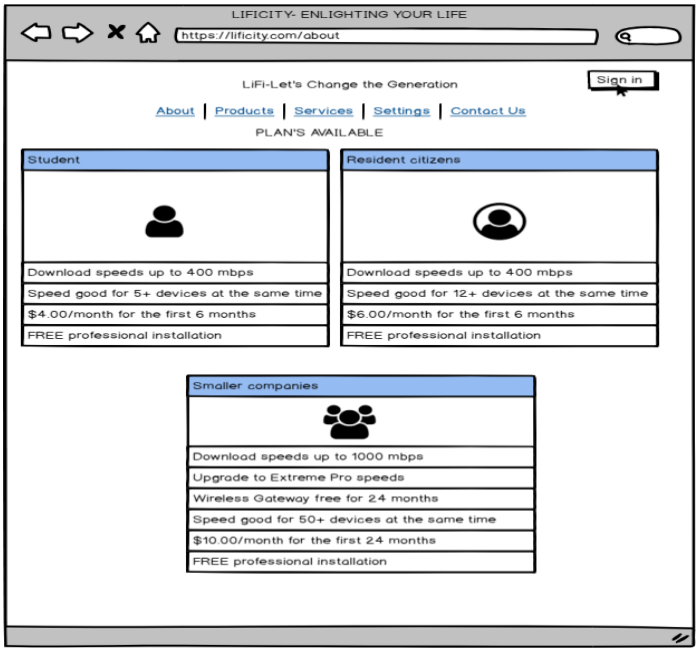
- The customer first enters the Lificity website, reads about the technology and arrives at a plan which suits him/her the best and clicks on the sign in. Use case Mockup 1 & 2.
- The customer then enters the portal and checks if the customer has an account to this website, clicks on the Sign-up button to register himself/herself on this website. Use case Mockup 3.
- The customer registers himself/herself through this portal. Once the registration is done, he/she clicks on the submit button. Use case Mockup 4.
- Once the customer has his/her account active, he/she can view their bill payments, to make the billing payments he/she then clicks on make payment button. He can either keep it on automatic bill payments or can pay the bill monthly Use case Mockup 5 & 6.
- He/she makes payment through the payment gateway. Use case Mockup 7.
- He/she can also use the usage comparison to check his/her previous month and this month usage of the services. Use case Mockup 8.
- He/ she can check out the product page to check for various services we provide with the products. Use case Mockup 9.
- If there are any kind of issues with the service, then the contact page would help them get connected to the agent. Use case Mockup 10.
- Services page is used to check the current service plan and device service on that plan. Use case Mockup 11.
- Settings page tells the details of the customer. Use case Mockup 12.

Mockup:

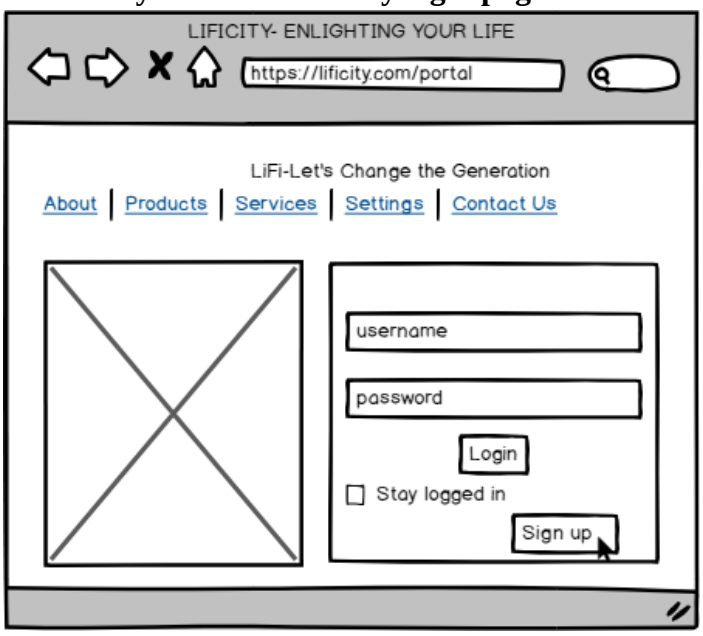
Gives a detailed visual design of our LiFiCity website and the steps through which each customer segment can access their account from start to finish.

1. LiFiCity website: About page

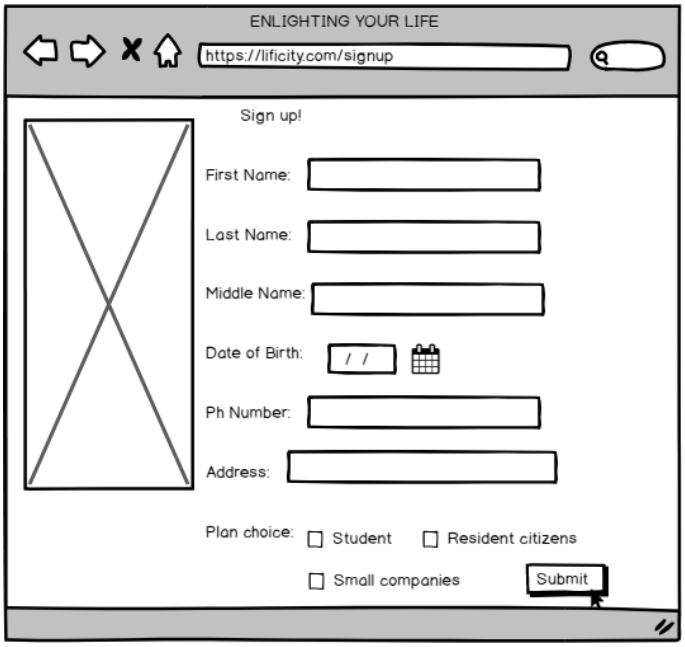
2. LiFiCity website: Plan availability page



3. LiFiCity website: LiFiCity login page

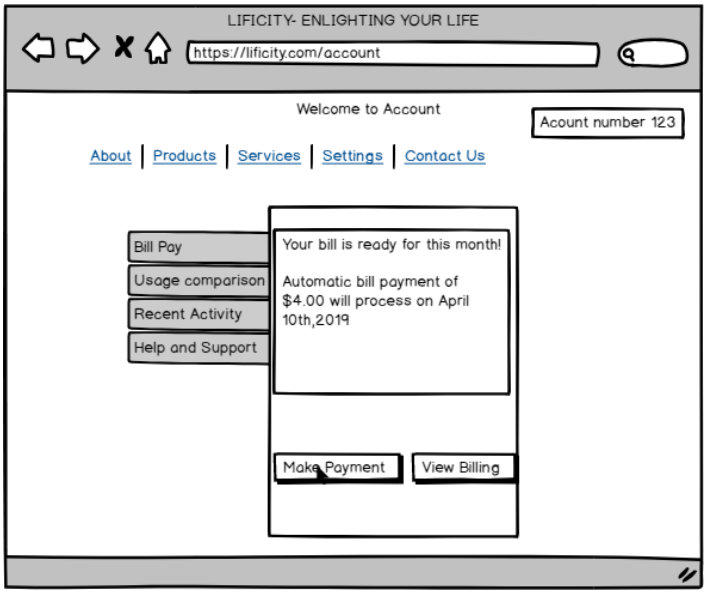


4. LiFiCity website: Sign up to register page

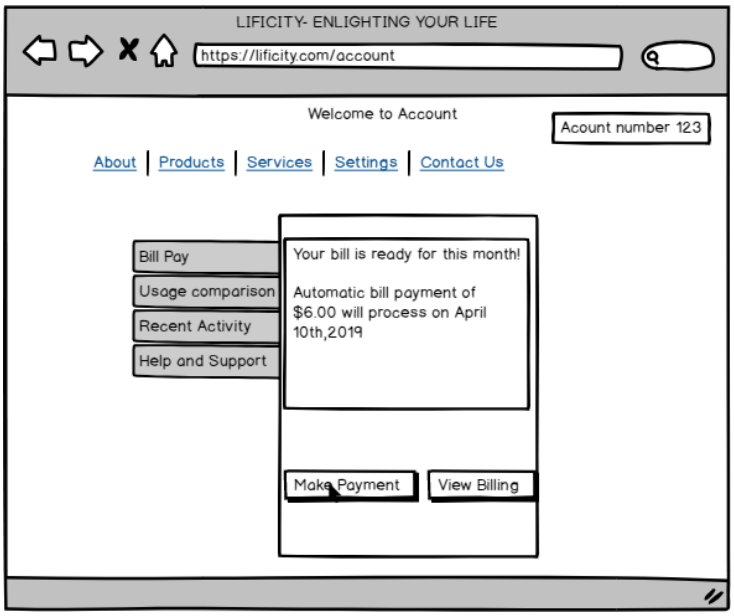


5. LiFiCity website: Account bill pay page

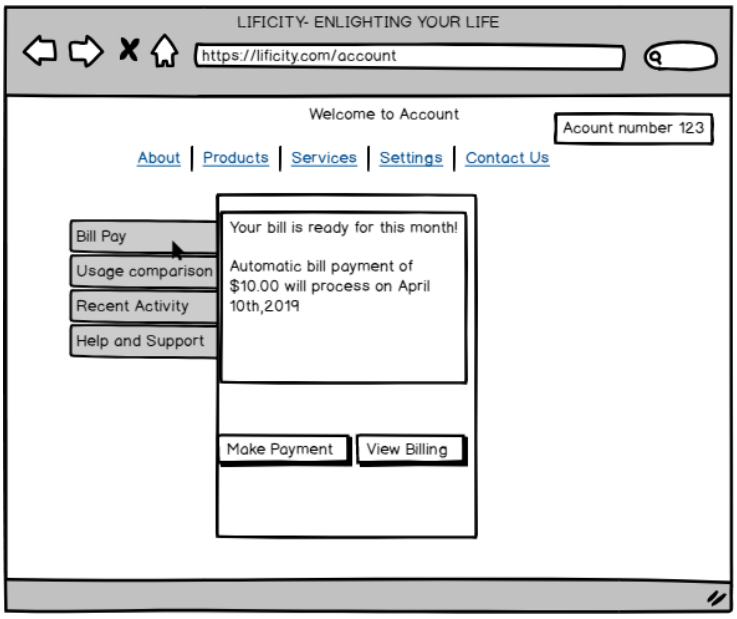
a) Student account bill pay page



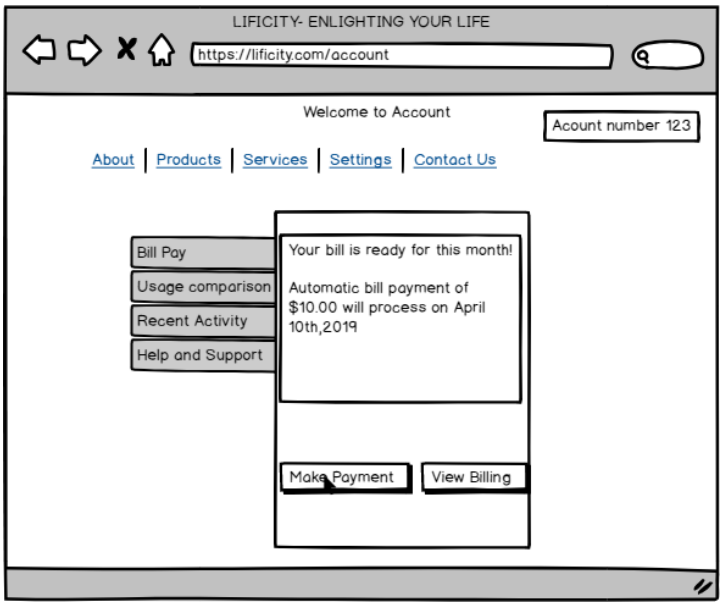
b) Residential bill pay page



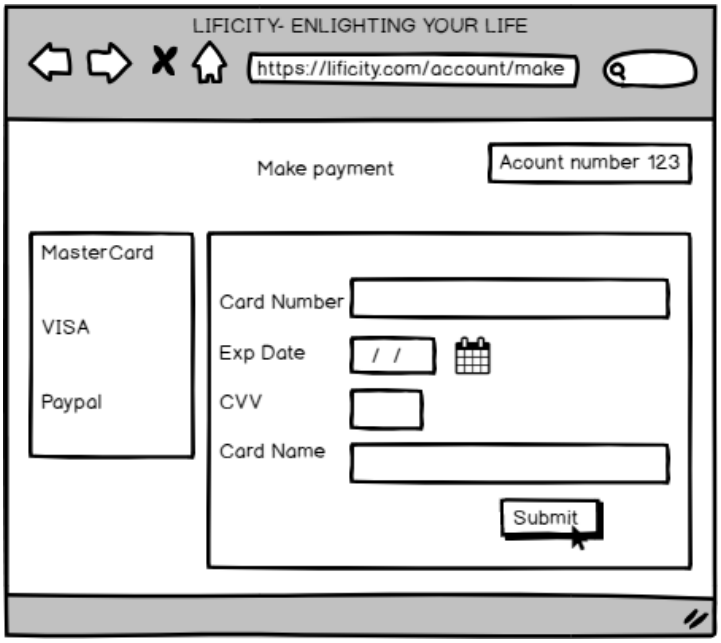
c) Small companies bill pay page



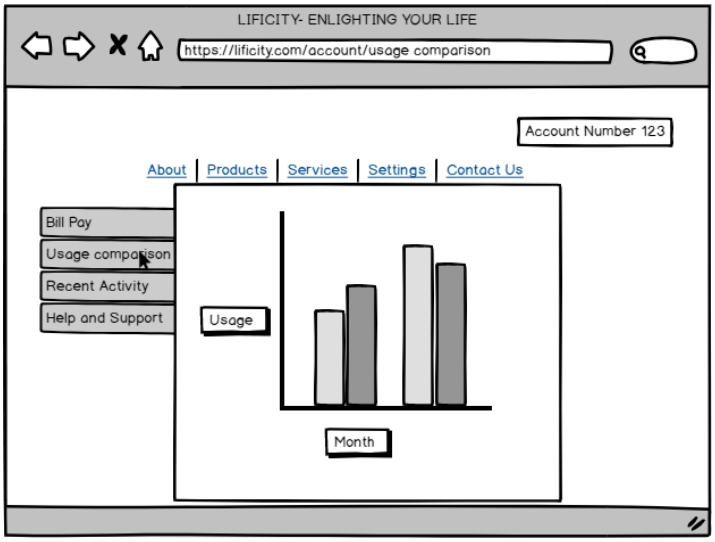
6. LiFiCity website: Bill payment view page



7. LiFiCity website: Make payment page

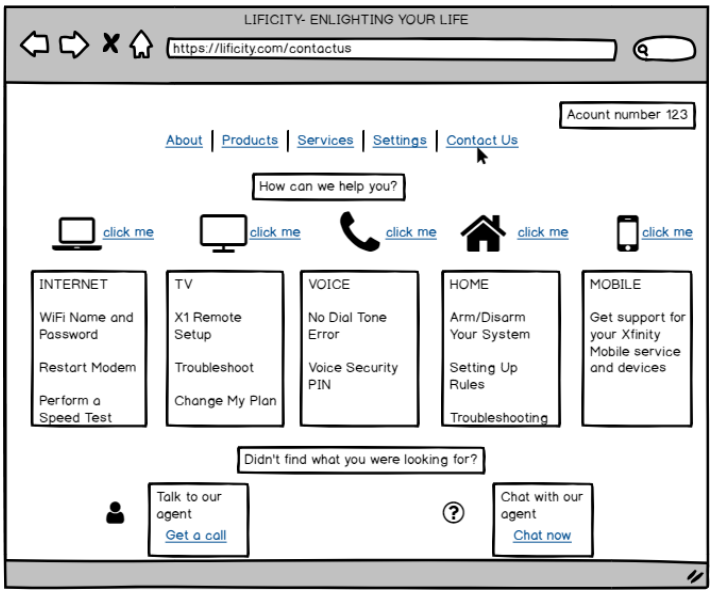


8. LiFiCity website: Usage comparison page

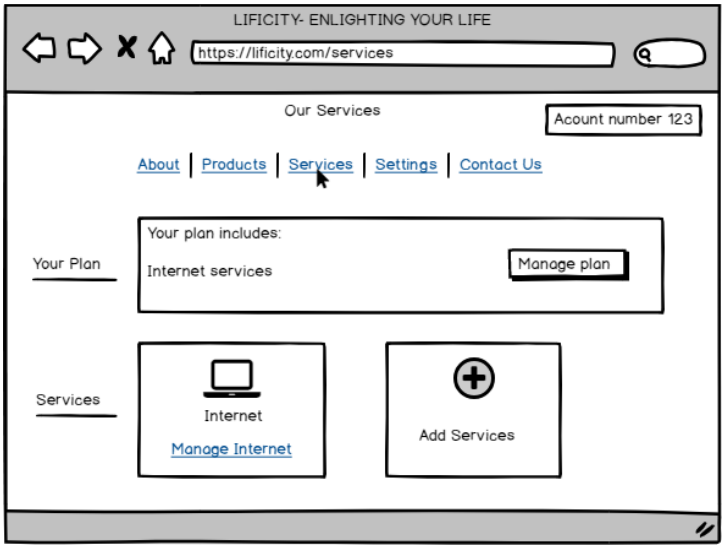


9. LiFiCity website: Integrated products page

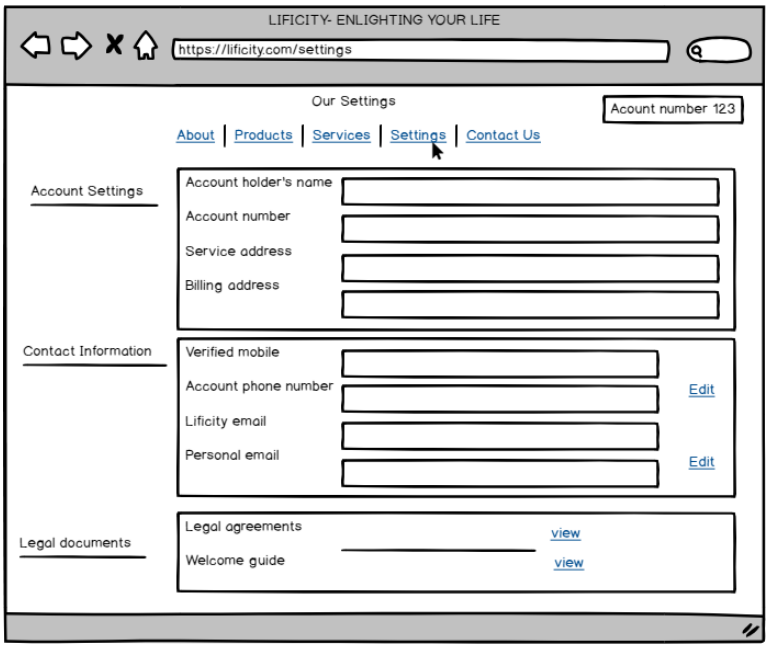
10. LiFiCity website: Contact us page



11. LiFiCity website: Our services page



12. LiFiCity website: Settings page



Detailed Design & Features Description

Design Principles

Our main aim of LiFiCity is to make user's life easier. The following are our design principles:

- Ease of usability, simplicity, and informative for the user who is going to use it.
- Data should be secured.
- Ensure that the website is compatible with the backend data.
- Integration with the database should be smooth.
- Customizable based on user requirement.
- The application should be scalable and with version change, it should be easy to use.
- Ensure the availability of the website.

Features/information architecture

Feature	Detail (Also on Wireframes)	Dependencies	Priority

Login	The user can provide login information with user id and password. This will be stored in the database and validated with our technology software in place. This step will be done after a user has registered.	Secure authentication and validation should be required in the back end.	1
Register	The user can register on the website by providing the details like ● First Name ● Last Name ● Middle Name ● Date of Birth ● Ph Number ● Address ● Plan choice	The data which is provided by the user should be stored securely.	1
Forgot Your Password	The user can request this functionality in case they do not remember the password. An email would be sent on their registered email id to generate a new password.	When a user is changing the password, it is required that it should be validated by sending an email to the user for cross verification.	2
User Account Details	This will record user personal info where the user can go through the products and services details they have enrolled for. The user will be able to see the various option available. ● Bill payments ● Usage Comparison ● Recent Activity ● Help and Support		2

Bill Payment	This page will give an option to the user whether to pay via VISA, Mastercard or PayPal Payment option with associated card details has been provided to the user. The user can also save the card details for the future transaction.		1
Make Payment	Through this page, User will get an option for entering the card details. And also ask the user to save these details for the future transaction. For User's convenience, A monthly auto deduction transaction option is also available to automatically deduct monthly charges.	Details are sensitive, so should be stored securely with encryption.	1
View Billing	This page provides a Billing summary view of the recent transaction for any upcoming or pending payments. As an additional feature, they can also view all their previous transactions. They can even request for upgraded services which are put across as an option to upgrade anytime, for customer's comfort.		2

Dashboard	This is an enhanced and customized version of View Billing page. To give User an enriching experience, visualizations of Billing summary for any due or paid payments is shown with the help of Pie charts and Donut charts. Bar graph and Line charts are put across to depict time series of previous billing statements. Flash tabs come across as an added Upgrade plan feature.		2
Usage Comparison	This interesting page allows users to check GB usage consumptions in comparison to the closest neighbor. In order to limit the consumption to go green in saving energy, this optional view feature is provided. In addition, a user can also keep a track of GB consumption in previous months with the help of Time series chart.		2

Recent Activity		Owner info Captain info	1
Help & Support section	● This section is provided under the Billing section to help a user with below queries: ● Understanding Your Bill ● What to expect with your first LiFiCity bill ● Where can I find my LiFiCity account number ● Set-up Automatic Payments using my billing information ● Paperless Billing ● Understand the taxes, fees, and surcharges ● Other charges in your bill ● Contact customer care for billing information		2

Product Details	This page provides details of listed products that can be integrated with Li-Fi technology to enhance customer experience. These are customized per user request. Some of the products are: ● Integrated Laptop ● Integrated Mobile ● LED Lights		1
Services	The user's plan and services information will be provided on this page. Two sections are included: Your Plan, Services. In the Your Plan section, the user can see the plan information and manage the plan. In the Services section, the user could manage the internet, and add services.	The content on the page is populated by the requested backend data. The content on the page should be adjusted according to the data of different users, and the interface should be adaptive.	1
Settings	The user can manage the profile which is divided into three parts - account settings, contact information, and legal documents. Account settings: ● Account holder's name ● Account number ● Service address ● Billing Address Contact information: ● Verified mobile ● Account phone number ● Lificity email ● Personal email Legal documents: ● Legal agreements ● Welcome guide	The data should be updated in the database and the security should be guaranteed. Each text field must have a prompt to guide the user on how to fill out.	1

About Us, Contact Us	The content pages such as about us, contact us will have users answer their queries and contact us for any technical help.		2
Logout	The user can log out from the website and return to the Home page.	Request a status change in the back end and send feedback to the web page.	1

v1 aka Minimum Viable Product (MVP)

Priority 0 – Critical Features

- Can log in to LiFiCity for the student plan
- Can create a user profile (first name, last name, date of birth, phone number, address)
- Can view the LiFiCity products
- Can purchase the LiFiCity products and services via VISA, Mastercard or PayPal
- Can view the usage
- Get help from LiFiCity

Priority 1 – Nice to have features

- Reset password
- Can update the user profile
- Users can view the recent transaction for any upcoming or pending payments
- Can save card details
- Users can view all their previous transactions

vNext

- Can log in to LiFiCity for small companies plan and residential citizens plan
- Add products and services for small companies and residential citizens
- Request for upgraded services
- Multiple payment methods

v longterm

- Recommended plans

Roadmap / Timing

Steps	Goal	Execution timing	Comments
1	Beginning the launch in beta version for school students	June	We will test our idea for a smaller sector like the Boston region.
2	Analysis of metrics and working on feedback.	July	Changes made based on feedback and aiming for residential citizens and small companies.
3	Beta version - Open for small companies	July	Implement the service in some small companies & residences and use our product integrated with Li-Fi products in companies.
4	Analyze the metrics and work on the feedback	August	Work on the changes as analyzed and make preparation for the full launch.
5	Launch our first version in the market	November	Make sure the service and products are delivered, and by the market, strategy creates awareness about our LiFiCity services and products.
6	Release the second version with changes by analysis of our previous launch.	December	Ensure changes by analyzing the feedback and add functionality as per the business requirements.
7	Analyze the metrics and work on feedback Target integrating LiFi in healthcare	February	We would make the changes that are required and make preparations to cover sector like health
8	Release the new version for another sector and make it more customer interactive. Availability of AI products integrated with LiFi component	April	Make availability of AI products are integrated with LiFi and ensure customer support and services.

Scenarios for Service Introduction

Expound on points of your roadmap where the service is introduced to new populations (alpha v beta v full launch). Talk about what alternatives were considered and why your proposed plan is the right one.

Metrics

1. Measure the number of sign-ups for Li-Fi service i.e. users requesting integration of Li-Fi technology into their existing lighting fixtures.
2. A measure of a total number of unique visits that are converted into buying optical components (key product drivers of Li-Fi service).
3. A measure of a number of smart devices used by customers that are key enablers for future Li-Fi growth.
4. Number of site views per week
5. Number of unique site views per week
6. Total time spent per visit
7. Percentage of Bounce Rate
8. Number of ad clicks
9. Average Product Rating as an indication for future sales
10. Number of Good or Bad Comments
11. Source of region i.e tracking which region are the services requested the most
12. Source of access i.e. Mobile, Tab, Laptop to optimize product dimensions per device size
13. Percentage of Organic and Inorganic traffic
14. Percentage of Referred traffic
15. Social media platform with maximum referred traffic
16. Percentage of Retention Rate

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International

At this stage, our products are mainly developed in the United States starting from Boston, because the development of Li-Fi relies on people's understanding of Li-Fi technology. If Li-Fi products are launched simultaneously in the US and global markets, we may encounter many unknown risks due to differences in the environment and culture of different countries.
In the future, if we operate smoothly in the US market, we will open the international market through the US company's branch offices in other countries, because Li-Fi technology can have better development within the enterprise. We will mainly develop the Asian market, introduce the concept of Li-Fi to the Asian market, launch special products for Asian companies, and expand to Europe in the next step.

Projected Costs

Here is the costs breakdown (including assumptions*) only for the development and release of the MVP version

Resources
Total number of people working on the website: 3 people (2 web developer, 1 designer)
Total Number of months: 2 months

Machine
Storage systems: Amazon S3 = 100GB per month
Hosting Service = $200

3(person)*30(cost per hour) = $90 per hour for 3 persons
40(hours per week) *$90 = $3600 per week for 3 persons
8(weeks)*$3600 = $2,88,00 for 2 months

Total Operational Cost = $2,88,00 + $300(Amazon service) + $200 = $2,93,00

***Assumption**
Cost of per person per hour = $30
Cost of Amazon S3 = $150 per month

The operational cost which we have calculated is completely based on the assumption that in 2 months all employees are working, solely for the given project to them. And allocated resources are working as per requirement.

Operational Needs

Development Team:
Web development - A strong development team needs to build user interactive website for LiFiCity. As this is the platform where the user is going to interact and perform all the activities, so the development team will provide GUI for it. And they will change GUI or will add more features as per future rollouts.
Tester - This team will focus on test cases, which are generated for the web site to work to smoothly. Also, will work on validation are working as per required or not? User data is secured or not? Payment details are encrypted or not? This will be a focus on providing secure and authenticate website.

Design Team:

LiFiCity website is for the user to access service and products, so designing should be easy to use and standard but with an appealing look and style. UX team will build a design which will be interactive for the user, so can decrease the cost of engagement.

Marketing Team:
Research team - Prior to building product, the team will engage with users, and perform brainstorming to understand the market's requirement. This team will analyze the market and based on that will decide future prediction for the product.
Marketing Strategy - Team will work on how to make aware people with product. By applying different marketing strategies will try to expand the market. Also, will hire people to perform online and digital marketing in order to obtain more profit.

Sales Team:
This team is focusing on analyzing the sales once the product will be out in the market. They will merge with the marketing team and based on sales data will predict the product's current market and will focus on expanding it.

Integration with Payment Gateway:
Payment is the most sensitive part of the transaction as it will take card details, we will merge with the third party for the handling the transaction and keeping user's data secure. This would provide one more protection layer to user information.

Addressing Caveats/risks

Range Limit - Viewable pathway implies the photodetectors must most likely really observe the light to catch the information. As it were, Li-Fi doesn't go through dividers, which is one of the central advantages of WiFi. Besides, the flag from a solitary WiFi hotspot can reach out for many feet. Li-Fi will be constrained to single rooms or other contained spaces. In order to deal with this problem, the main application scenarios of our products are office, school, home and so on.
Unstable Connection - It is necessary for a Li-Fi system to maintain continuous and high-speed connectivity within the coverage area of a Li-Fi cell and between the Li-Fi cells. So advance schemes for link layer are required which can maintain rate adaptation and frame aggregation to cope up with connectivity issues.
Cost Limit - The cost of internet deployment for Li-Fi and the interference of wireless connections is a limiting factor which can reduce the achievable data rate using the internet. Therefore, it

becomes a challenging task to propose a model which can provide internet using Li-Fi for large scale communication.

Security Risks - An attacker may be present inside or outside a room can perform eavesdropping using the light signals. These signals can be obtained from the gap between floor and door, cracks inside flooring or from partially shielded windows. This threat indicates that more research is required to understand and resolve the security issues and privacy concerns of Li-Fi network.

Competition - Li-Fi is a faster and cheaper wireless network connection service for users. In order to be able to take advantage of the Li-Fi market, we must maintain the advantages of faster and cheaper, otherwise, our business is easily affected by competitors.

Risk	**Solution**
Range Limit	Application Scenarios: Office, school, home. Develop ways to break through this technical limitation.
Unstable Connection	Advance schemes for link layer.
Cost Limit	Propose a model which can provide internet using Li-Fi for large scale communication. In the early stage, we will invest in technology development, and later increase the efficiency of enterprises through small profits but quick turnover.
Security Risks	Identity authentication.
Competition	Maintain low cost. Maintain stability of the Li-Fi connection.

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