**Iraqi Kurdistan Region**

**University of Salahaddin-Erbil**

**College of Engineering**

**Department of Software and informatics**

**A Report Submitted to the Software Engineering Department**

**University of Salahaddin-Erbil**

**In the Fulfillment of the Requirement for Internship program**

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**Fourth stage at software engineering department**

**My experience and skills that I learned during 3 moths of internship in Light Way company**

## Summarize:

Light Way, established in 2019, is an information communication technology (ICT) company based in Erbil. It aims to provide high-quality internet services and has partnered with leading ICT business partners to strengthen its position in the market. Light Way offers various internet services, including Dedicated Fiber Optic, Dedicated Point to Point Internet, and V-SAT satellite Internet services. Additionally, the company specializes in maintenance support, project management, security solutions, and intelligent buildings.

As a software engineering intern at Light Way, I had the opportunity to contribute to the company's operations. I was involved in networking configuration tasks, such as setting up and organizing parameters for devices like routers, switches, and firewalls. I also gained experience in operating the company, which included managing and providing internet connectivity services. This involved technical know-how, infrastructure management, customer service, and commercial operations.

Providing internet services requires the setup of networks and establishing reliable connections for users. This can be achieved through various technologies, including wired connections like Ethernet or fiber optics and wireless technologies like Wi-Fi or cellular networks. Technical support is crucial to assist users with connection issues and network-related problems.

By providing internet services, businesses and individuals gain access to a vast amount of information, communication tools, online resources, and collaboration opportunities. The internet has become an integral part of daily life, enabling activities such as education, entertainment, e-commerce, and research. Internet service providers play a vital role in ensuring the availability and reliability of internet connectivity.

During my internship, I developed several skills, including configuring networking devices like switches, routers, and access points. I learned how to set up network parameters, manage IP addresses, and ensure efficient data flow. I also gained experience in analyzing and organizing sales data, assisting the sales team, and providing customer support.

Operating an internet services provider business involves establishing and maintaining a strong network infrastructure, offering excellent customer service, and ensuring reliable network monitoring and maintenance. By focusing on these aspects, ISPs can establish a solid reputation, grow their clientele, and succeed in the competitive market.

## Introduction:

Light Way established in 2019 to best serve the highly demanding requirements of this rapidly growing and dynamic market. Based in Erbil, Light Way is working with number of world's leading professional Information Communication Technology (ICT) business partners to strengthen its leading position and offer the best service and quality for its customers. It has several services

INTERNET SERVICES (ISP):

 is considered one of the most important leading companies in the field of communications, information technology and Internet services, as it provides Internet services in several types to suit each customer while ensuring the best quality of service provided to the customer.

1- Dedicated Fiber Optic.

2- Dedicated Point to Point Internet.

3- V-SAT satellite Internet services

MAINTENANCE SUPPORT & PROJECT MANAGEMENT

Light way provides all services related to maintenance and technical support for information technology networks and their infrastructure.

We also have extensive experience in managing information technology projects and one of our most important services in this aspect

SECURITY SOLUTIONS AND INTELLIGENT BUILDINGS

provides Smart Building advisory, assessment, and managed services for organizations in commercial, corporate, campus, and government real estate. Helps customers leverage solutions that enhance experience, increase productivity, lower costs, and reduce risks for new building projects, existing portfolios, and smart community development.

## Duties and accomplishments:

As a software engineering intern at Light way, I was given a variety of responsibilities to help me learn and contribute to the company's operations. Here are several examples:

## 1- Networking Configuration:

The process of setting up and organizing the various parameters and settings within a computer network to enable connectivity and communication between devices is referred to as networking setup. It entails setting the proper network settings, IP addresses, subnet masks, DNS servers, and other pertinent parameters on network devices like routers, switches, firewalls, and access points.

## 2- Operating the company

Managing and providing clients with necessary internet connectivity services is part of running an internet services provider (ISP) business. Technical know-how, infrastructure management, customer service, and commercial operations are all necessary. The ISP provider is in charge of upholding a reliable network infrastructure, contracting with upstream service providers for internet access, and providing a variety of service plans that are specifically designed to satisfy the requirements of various client segments. Additionally, the business must guarantee regulatory compliance, deliver dependable billing and accounting services, and offer trustworthy client service. To maintain good uptime and performance, network monitoring and upkeep are essential. In order to maintain their competitiveness in the market and draw in new clients, successful ISPs often take part in business development and marketing initiatives. An ISP may establish a solid reputation, grow its clientele, and succeed in the competitive market for internet services by concentrating on providing dependable connection, top-notch customer support, and remaining up to date with industry developments.

### 3- Internet providing

In order to provide internet, networks must be set up and dependable connections for users must be made. This may be done through wireless technologies like Wi-Fi or cellular networks or wired connections like Ethernet or fiber optics. Technical support is a crucial component of offering internet, ensuring that consumers get help with connection issues and network-related issues.

By offering internet services, businesses and individuals have access to a wealth of data, tools for communication, online resources, and chances for cooperation. Because it enables users to engage in education, entertainment, e-commerce, research, and much more, the internet has become a necessary component of daily life. The growth and enhancement of internet services continue to be driven by the ongoing evolution of technology and the rising need for connection, making it a crucial component of our globally interconnected world.

### Skills learned:

During my time at light way company I gained several skills and knowledges that will benefit me in the future and they are:

### 1- Configuring networking devices:

A computer network's connection and successful communication are established through the process of setting its network devices, protocols, and services. It requires defining a variety of parameters and settings that regulate the behavior and operation of network devices and services. I set up a variety of equipment throughout my internship, including:

1- Switches
2- Routers
3- Access Point

## Switches:

Switch configuration normally include specifying the switch's default gateway, subnet mask, and administrative IP address. This makes it possible to administer switches remotely and guarantees that the switch can talk to other networked devices. VLANs may be set up to separate traffic and divide the network into sections. Furthermore, port options like speed, duplex mode, and activating features like Power over Ethernet (PoE) or port security are chosen based on the particular needs of linked devices. Network managers may manage traffic flow, improve network performance, and guarantee appropriate device connection by configuring switches. In light way they use planet and cisco switches.



## Routers:

The configuration of a router involves configuring its IP address, subnet mask, and default gateway. As a result, the router may connect to the internet and transport traffic between various networks. In order to provide dynamic routing and ease the exchange of routing data with other routers in the network, routing protocols like OSPF or BGP may be established. Access control lists (ACLs) can be used to enforce security regulations and manage traffic flow. Furthermore, Network Address Translation (NAT) configuration enables the translation of private IP addresses into public IP addresses, enabling devices on a private network to access the internet. Network administrators may set up network connectivity, control traffic flow, and guarantee safe and effective data transfer by configuring routers. Its also the same for router they use planet and cisco routers it can change by the customer requests.

## Access Point:

access points (APs) enable wireless network communication. A unique IP address is also given to the AP after configuring the wireless network name (SSID), security options including encryption, and authentication procedures. Depending on the requirements of the particular wireless network, additional characteristics can be adjusted, such as radio channel selection, transmit power, and client isolation. To guarantee seamless roaming for wireless clients, administrators can set up numerous APs to cooperate in a wireless network. Network administrators can configure access points to set up dependable and secure wireless networks that link wireless devices and let users access network resources without using cable connections. Here they use unify access points.

## Operating company:

 I worked on several tasks and I was given several responsibilities:

## Establish and maintain networks

I was given the task of Establishing and maintain a strong network infrastructure that comprises the required servers, routers, switches, and other hardware. This infrastructure should be able to handle the bandwidth requirements and offer clients scalable and dependable access.

The network architecture must be properly planned and designed by the ISP. In order to have the best network speed and scalability, this entails deciding where servers, routers, switches, and other hardware components should be placed. The network architecture should be planned with the predicted bandwidth needs of the ISP's

customer base in mind, taking into consideration things like estimated data traffic, peak use times, and anticipated future growth.

The capacity, performance, and reliability of the hardware components, such as routers and switches, must be considered while choosing them. These devices allow for the switching and routing of data packets throughout the network, guaranteeing precise and effective information transmission between users and the wider internet. To reduce downtime and preserve uninterrupted service in the event of hardware failures or network outages, redundancy measures such as backup routers or failover mechanisms should be put in place.

## Customer Services

A key component of running an internet service provider (ISP) business is providing excellent customer assistance. For the purpose of guaranteeing customer pleasure, resolving difficulties, and preserving a good connection with clients, it is crucial to offer quick and dependable customer support services. The following are essential elements of an ISP's excellent customer service:

1. Helpdesk Systems: To effectively handle and monitor client questions and issues, helpdesk systems or customer support ticketing systems are implemented. Customers may file their complaints using these tools, i worked as help desk supporter and my job was making sure quickly and efficiently track, prioritize, and address them.
2. Multiple support channels are available to satisfy various client preferences. This may include live chat, email, phone, or even self-service tools like online FAQs or knowledge bases. By offering a range of channels, clients may select the most practical way to request support. There was multiple ways to gain customer complains for example there was active call center and also emails and my job was analyze and arrange them to the right place for example if the complain was about physical errors like (Fiber cable ) so I was forwarding them to CMR(Customer Relationship Management) staff
3. By providing responsive and reliable customer support services, an ISP demonstrates its commitment to customer satisfaction and reinforces its reputation for delivering excellent service. Quickly resolving technical difficulties, assisting clients with account management, and fostering great customer connections all contribute to the success and expansion of the ISP firm when provided by effective customer service. There was customer services from 9am to 5pm.

## Network monitoring and maintenance

Network monitoring and maintenance are critical aspects of operating an internet services provider (ISP) company. Delivering constant and dependable internet services is ensured by putting in place trustworthy network monitoring systems and carrying out routine maintenance tasks. For an ISP, the following are some essential elements of good network monitoring and maintenance:

1. Network Monitoring Systems: Deploying robust network monitoring systems that continuously monitor network performance, availability, and traffic patterns. These systems gather information on a variety of network metrics, including device health, bandwidth usage, latency, and packet loss. Administrators can quickly intervene when abnormalities or potential problems are detected thanks to real-time monitoring.

2. Issue Resolution and Troubleshooting: When issues do arise, network monitoring systems help in diagnosing and troubleshooting problems. They help network administrators speed up the problem-solving process by illuminating the underlying causes of the problem. To fix hardware issues, software bugs, or configuration issues, this may need working with other teams or vendors.

The company guarantee high uptime, reduce downtime, and provide consistent and dependable internet services to its clients by putting in place trustworthy network monitoring systems and carrying out routine maintenance tasks. An effective network infrastructure is a result of proactive monitoring, prompt problem-solving, and continuing network improvements. This improves customer happiness and supports the ISP company's expansion and profitability.

Operating an ISP business involves a blend of technical know-how, financial savvy, and a customer-centric mindset. An ISP may establish a solid reputation, grow its clientele, and experience long-term success in the fiercely competitive internet services market by offering dependable connection, first-rate customer care, and staying abreast of industry changes.

## analyzing and organize the sales data

Supporting the sales staff is essential for a networking company's development and success. In a networking firm, you may help the sales staff be successful in generating sales, attracting new clients, and developing enduring connections with existing clients. Your technical know-how, product experience, and market insights are crucial in assisting the sales team in positioning and promoting the products and solutions of the networking firm. I was responsible for analyzing the sales data and helping them to organize and simplify their work. For the purpose of gaining useful insights, spotting patterns, and improving sales tactics, it is essential to analyze and organize the data from the sales team. The following procedures will help you manage and evaluate sales team data effectively:
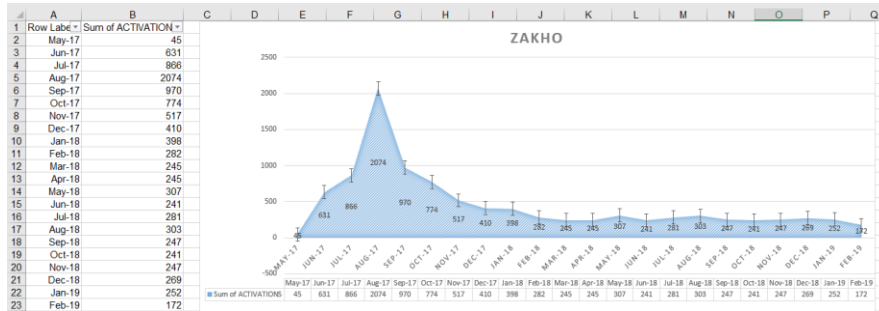
1. Data gathering: Gather pertinent sales data from a range of sources, including customer relationship management (CRM) programs, sales reports, spreadsheets, and other data troves. By verifying and cleaning the data before analysis, you can make sure that it is accurate, comprehensive, and consistent.

2. Data Visualization: To portray the sales data in a clear and succinct way, use data visualization tools. Charts, graphs, and dashboards are examples of visual representations that make trends, comparisons, and patterns easier to grasp. Select software or tools for visualization that are suited for the amount and complexity of your sales data. I have created many charts and excel sheets to keep an eye and track the company's data and performance for example this sheet represents the activation of the networks by date and area:
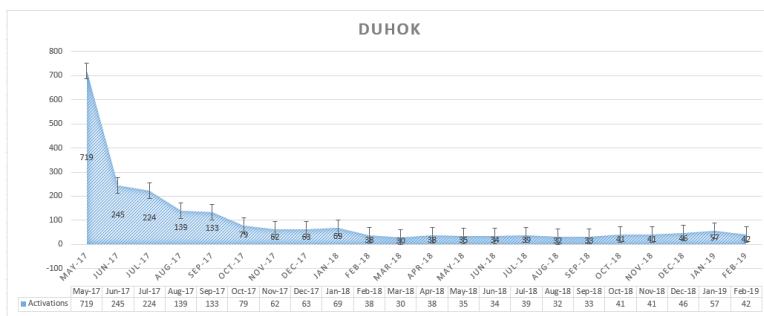


| | Activation Report - Duhok(From the beginning 13 apr 2023) | | |
|---|---|---|---|
| 1 | | | |
| 2 | Date | Area ( Domiz ) | |
| 1124 | 4/Jun/20 | 4 | |
| 1125 | 5/Jun/20 | 0 | FRIDAY |
| 1126 | 6/Jun/20 | 3 | |
| 1127 | 7/Jun/20 | 5 | |
| 1128 | 8/Jun/20 | 4 | |
| 1129 | 9/Jun/20 | 0 | |
| 1130 | 10/Jun/20 | 2 | |
| 1131 | 11/Jun/20 | 0 | |
| 1132 | 12/Jun/20 | 0 | FRIDAY |
| 1133 | 13/Jun/20 | 2 | |
| 1134 | Grand Total: | 3001 | |
| 1135 | | | |
| 1136 | Total Ports: | 4169 | |
| 1137 | % Done | 72 | |

Also this sheet represent activations in zkho:





3. **Comparative analysis:** Conduct a comparative study by contrasting recent sales figures with earlier figures or standards from the industry. This aids in evaluating performance patterns over time and locating opportunity or improvement areas. Comparative analysis offers insightful information on the efficacy of sales methods and the influence of outside variables on sales success. For competitive charts a have created a sheet to track the performance of the sales staff one by one and combine them all:
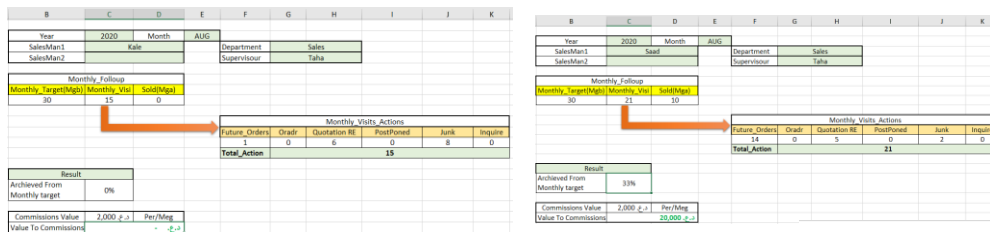




%FROM Total Sold



| Summary | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Salesman Name | Supervisour | Monthly_Target (Mgb) | Sold(Mga) | Archieved From Monthly target | Monthly_Visit | %FROM Total Target | %FROM Total Sold | %FROM Total Visits |
| Rawend | Taha | 30 | 50 | 167% | 12 | 14% | 38% | 12% |
| Saya | Taha | 30 | 50 | 167% | 21 | 14% | 38% | 21% |
| Shad | Taha | 30 | 0 | 0% | 4 | 14% | 0% | 4% |
| Chya | Taha | 30 | 0 | 0% | 15 | 14% | 0% | 15% |
| Saad | Taha | 30 | 10 | 33% | 21 | 14% | 8% | 21% |
| Kale | Taha | 30 | 0 | 0% | 15 | 14% | 0% | 15% |
| Bushra | Taha | 30 | 20 | 67% | 12 | 14% | 15% | 12% |
| Total | | 210 | 130 | | 100 | 100% | 100% | 100% |

| Supervisour | 210 | 130 | 62% |
|---|---|---|---|
| Taha | | | |
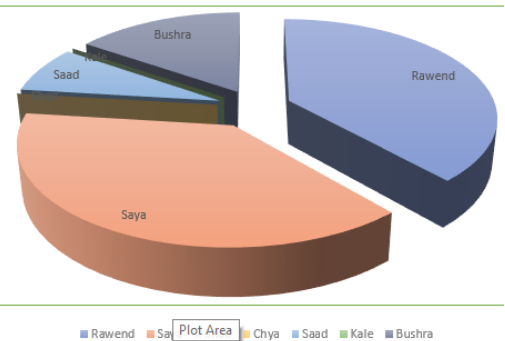
## The technique of providing internet

The technique of providing internet access from PPPoE (Point-to-Point Protocol over Ethernet) to a host involves establishing a PPPoE connection between the host device and the internet service provider (ISP). Here is a general description of what happens:

1. The host device (such as a computer, router, or modem) must be setup in order to start the PPPoE connection. Typically, to do this, one must log into the device's network settings and enter the PPPoE connection information supplied by the ISP.
2. PPPoE Authentication: The host device communicates with the access concentrator (AC) or authentication server of the ISP by sending a PPPoE discovery packet. The AC replies with the required authentication information, which includes a username and password.
3. Establishing a PPPoE session with the ISP's AC requires the host device to use the specified authentication information. To negotiate session parameters and authenticate the connection, control packets must be exchanged.
4. Dynamic Host Configuration Protocol (DHCP) server of the ISP assigns the host device an IP address after the PPPoE session has been established. The host device may communicate with other internet-connected devices thanks to its IP address.
5. Data Transfer: The host device may now transmit and receive data over the internet since the PPPoE connection has been established and an IP address has been assigned. The PPPoE framework is used to transport data packets between the host device and the ISP's network.

## Conclusion:

In conclusion, Light Way is a leading company in the field of communications, information technology, and internet services. Established in 2019, Light Way has positioned itself as a provider of high-quality services by collaborating with world-class ICT partners. The company offers various services, including internet services (ISP), maintenance support and project management, and security solutions for intelligent buildings.

As an intern at Light Way, the individual had the opportunity to gain valuable skills and knowledge. They were involved in networking configuration, which includes setting up and organizing parameters for computer networks to enable connectivity and communication between devices. This involved configuring networking devices such as switches, routers, and access points.

Additionally, the intern gained experience in operating the company, which involved managing internet connectivity services, infrastructure, customer service, and commercial operations. They also learned about providing internet services, including setting up networks and ensuring reliable connections for users.

During their internship, the intern acquired skills in configuring networking devices, such as switches, routers, and access points. They also learned about network monitoring and maintenance, as well as analyzing and organizing sales data to support the sales team.

Overall, the internship at Light Way provided the individual with practical experience in various aspects of the networking and internet services industry, equipping them with valuable skills for their future career.

## Acknowledgments:

I would like to express my deepest gratitude and appreciation to Light Way Company for providing me with the opportunity to intern at their esteemed organization. This internship has been an invaluable experience for me, allowing me to gain practical knowledge and skills in the field of information communication technology (ICT) and contribute to the company's operations. I would also like to extend my heartfelt thanks to the Human Resources department and my supervisor for their guidance and support throughout my internship journey.

First and foremost, I would like to thank the Human Resources team at Light Way Company for their meticulous efforts in selecting and onboarding me as an intern. From the initial application process to the interview and induction, their professionalism and dedication made me feel welcomed and valued as a member of the team. Their support in ensuring a smooth transition into the company and providing me with the necessary resources and information were instrumental in my overall internship experience.

I am incredibly grateful to my supervisor for their guidance, mentorship, and trust in allowing me to take on a variety of responsibilities during my time at Light Way. Their expertise and experience in the field of ICT have been invaluable in shaping my understanding and enhancing my skills. Their continuous support, encouragement, and constructive feedback have enabled me to learn and grow both personally and professionally.

Furthermore, I would like to extend my appreciation to the entire team at Light Way for fostering a positive and inclusive work environment. The collaborative nature of the team and their willingness to share their knowledge and experiences have significantly contributed to my learning and development. I am grateful for the opportunities I had to collaborate with colleagues from different departments, which broadened my perspective and allowed me to gain insights into various aspects of the company's operations.

Lastly, I would like to express my gratitude to Light Way Company as a whole for providing me with a platform to apply my skills, learn from industry professionals, and contribute to the organization's success. The exposure to real-world projects and the hands-on experience I gained during my internship will undoubtedly be instrumental in shaping my future career endeavors.