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THE IMPACT OF MATERIAL'S PRICE HIKE ON THE PRODUCTION COST: A CASE STUDY OF SUMMIT COMMUNICATIONS LTD.

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ABSTRACT

This research paper examines the impact of material price hikes on the production cost of Summit Communications Ltd, a telecommunications company in Bangladesh. The study aims to analyze the breakdown of production costs, describe the network-building operations, and suggest recommendations based on the findings. The paper includes historical data and trends in material prices and production costs that can aid in budget creation, cost analysis, and audit purposes. The results show that manufacturing has become more expensive over time as a result of rising labor expenses and the cost of purchasing equipment. Materials prices also fluctuate due to the pandemic, going up significantly in 2018, down significantly in 2019, and then back up in 2021. The study looks at the particular products that underwent price hikes, such as fuel, cement, sand, stone, and rod, as well as how the company handled these difficulties. The findings reveal that Summit Communications Ltd. implemented several strategies to mitigate the impact of rising material costs on production, including cost-cutting measures, renegotiating contracts with suppliers, and exploring alternative materials. The company's financial performance was negatively impacted by the material price hikes, but it was able to maintain its position in the market. The study offers valuable insights into how companies can navigate the challenges of rising material costs and maintain their position in the market.

INTRODUCTION

Summit Communications Limited is a leading telecommunications company in Bangladesh that provides a range of services including International Terrestrial Cable (ITC), nationwide telecommunications transmission network (NTTN), and telecom towers. The company was established in 2010 and has since become one of the largest ITC service providers in the country, accounting for one-fifth of total industry bandwidth (Ali et al., 2020).

SComm has established access to over 44,000 Km fiber optic network across the nation covering all 64 districts as well as 463 Upazilas and more than 3,650 government offices. The company's vision is to connect every household in Bangladesh with world-class multimedia services with the objective to help develop a Digital Bangladesh. To achieve this vision, SComm aims to establish and operate state-of-the-art telecommunication transmission network for the country's ICT and Telecom sector, innovate and implement state-of-the-art transmission technology with durable, reliable, scalable, and

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affordable service quality, and explore and work toward future potential of different multimedia services on multi-operator model (Ali et al., 2021).

Summit Communications Limited is a concern of the Summit Group, which is a leading conglomerate in Bangladesh with diversified business interests in various sectors including power, energy, infrastructure, and telecommunications. The company has a strong commitment to providing high-quality services to its customers and has invested heavily in developing its infrastructure and technology to meet the growing demand for telecommunications services in Bangladesh (Chowdhury et al., 2020; Chowdhury et al., 2021a; S. Chowdhury et al., 2021b).

One of the key services provided by SComm is International Terrestrial Cable (ITC), which is a critical component of the country's telecommunications infrastructure. SComm is one of the largest ITC service providers in Bangladesh and provides bandwidth via underwater cables such as I2I, IMEWE, TIC, TGN-EA, SMW3, and SMW4 in collaboration with Tata Communications Limited and Bharti Airtel. The company has also ensured 99.99% uptime in half circuit for enterprise networks in recent years, and a growing number of enterprise links have joined as trusted partners (Iqbal et al., 2021).

Another major service provided by SComm is the nationwide telecommunications transmission network (NTTN), which is a high-speed fiber optic network that covers all 64 districts in Bangladesh. The network provides high-quality voice, data, and video services to customers across the country and is used by all major mobile phone operators and internet service providers (Kader et al., 2019).

In addition to ITC and NTTN, SComm also operates telecom towers through its subsidiary, Summit Towers Limited (STL). Telecom towers are regarded as the lifeblood of mobile telecommunications systems, and STL (Kader et al., 2021a; Kader et al., 2021b; Kabir et al., 2021). The findings of the study will help management in its attempts to enhance Summit Communications Limited's network construction activity. The paper presents a variety of historical data as well as trends in material prices and production costs that will aid in the creation of new budgets, cost analyses, audit purposes, and many business areas. The study's main goal is to analyze the impact of material's price hike on the production cost of Summit Communications Ltd. (Nayeen et al., 2020; Nahar et al., 2021).

In the upcoming parts, this paper will look at different parts of the research. It will start by talking about what experts think about the topic. The research methodology, including the methods used for data collection and analysis, will next be explained. After that, it will show important things that were found and analyzed. Then, it will talk about what these findings mean and why they're important. Lastly, the article will end by wrapping up the main points and suggesting ideas for future research.

LITERATURE REVIEW

The surge in raw material prices is posing challenges for manufacturers across supply chains. Besides dealing with the pandemic's effects, such as slowing supplier deliveries and labor availability, four significant trends are impacting raw material costs: strong global market demand, China's robust economic recovery, a 58% increase in oil prices since November 2020, a global shortage of shipping containers leading to higher transport costs from Asia to Europe, and additional non-tariff costs resulting from new UK customs arrangements with the EU for imported raw materials. These factors are further restricting supplies and adding to the cost of raw materials in the UK (Rahman et al., 2021a; Rahman et al., 2021b).

According to the Bangladesh Bureau of Statistics (BBS), the production costs in various sectors have surged in FY21. In the garment industry, nine out of ten sub-sectors, including spinning, cotton, silk, synthetic, jute, handloom, and knitwear, experienced cost increases of 1%-58%. The Domestically Produced Industrial Goods index indicates a 56.22% rise in spinning and cotton textile fiber production costs and a 13.62% increase in textile production costs over the year. Among heavy industries, cement production costs rose by 5%, while rod, bricks, and sand prices have also seen significant hikes. The recent fuel price hike is anticipated to add further pressure to production costs and result in higher product prices (Shahriar 2021a; Shahriar 2021b)

Record-high material cost increases for steel, copper, and plastics have resulted from high demand and supply chain disruptions, including the recent Texas freeze. This financial pressure affects both manufacturers and suppliers. To address this, engineering and sourcing professionals can use value analysis and engineering to reduce material usage, audit purchases for justifiable price increases, and consider distributor bulk buying contracts. Digital manufacturing simulation software helps estimate part costs and compare manufacturing methods. These actions empower professionals to make informed decisions and lower material costs during the ongoing material cost crisis (Zayed et al., 2021a; and Zayed et al., 2021b).

The rise in building material costs is significantly impacting the construction sector. According to a recent survey, more than 65% of respondents believe the increase is hurting demand, and 70% reported a hit on profits. The construction industry is grappling with a shortage of skilled labor, causing labor expenses to surge. Additionally, the cost of materials is escalating in tandem with demand. Major players, such as building owners, contractors, and suppliers, are facing challenges due to rising costs. To combat these issues, companies are employing value engineering strategies to reduce costs without compromising quality. With careful management, the construction sector can continue to progress despite these challenges (Ahmed et al., 2022; Al-Quraan et al., 2022; Faisal-E-Alam et al., 2022).

The pump and rotating equipment industries have been severely impacted by an unprecedented surge in raw material costs. According to the U.S. Bureau of Labor (June 2007 to June 2008), steel-mill product prices rose by 30.4%, while crude petroleum costs skyrocketed by 105.6%. Iron and steel scrap prices surged by 96.9%, with diesel fuel experiencing an 85% jump during the same period. The worldwide demand for products like steel and petroleum, driven by countries like India and China, is expected to keep prices high. For instance, U.S. hot-rolled steel costs surged from $400 to $1,154 per metric ton by mid-May 2008. Manufacturers struggle to absorb the increases, necessitating passing on the costs

to consumers, presenting challenges for the industry in coping with the volatile global economy (Mia et al., 2022; Rubi et al., 2022; Zayed et al., 2021a; Zayed et al., 2021b; Zayed et al., 2022a; Zayed et al., 2022b; Zayed et al., 2022c; Zayed et al., 2022d; Bhuiyan et al., 2022; Shayery et al., 2022; Khan, et al., 2023; Edeh et al., 2023).

MATERIALS & METHODS

Study Design

The Survey is a research approach that described the collection of data from a sample of individuals based on their answers to questions that were asked. Since this type of survey design makes it easier for the researcher to comprehend and clearly state the issue, it was used to describe how the impact of material price increases on the production cost of Summit Communications Ltd.

Sample Procedure

Purposive sampling, a non-probabilistic methodology, was utilized in the study to choose SComm department staff as participants. In order to concentrate on gathering specific data, the researcher purposefully omitted those who did not fit this criteria. Because it is effective at saving both time and money, purposeful sampling was chosen. It's vital to highlight that neither the researcher nor the nation caused the problem to worsen.

Research Instrument

This study aimed to determine the impact of material price increases on the production costs of Summit Communications Ltd. The data was collected using a questionnaire instrument adapted through Google Forms, as it was efficient in collecting responses from a large sample size and suitable for the researcher's study. The questionnaire is a technique of data collection where each person responds to the same set of questions. The use of this tool was guided by the nature of the data to be collected, time constraints, and the objectives of the study. Direct observation, oral or verbal conversation with required department employees, study materials, and other analytical techniques and tactics, as well as current and historical dates, may be included in this paper. As a result, it includes only secondary data.

RESULTS & DISCUSSIONS

Network Expansion and Maintenance Work

SComm has already established access to over 44,000 Km fiber optic network across the country covering all 64 districts as well as 463 Upazilas and more than 3,650 government offices.

The network expansion work of Summit Communications Ltd. under NTTN license has consist of three parts. Those are HDD work, HH Making and Cable blowing work. The network expansion and maintenance work are conducted by using underground optical fiber cable.

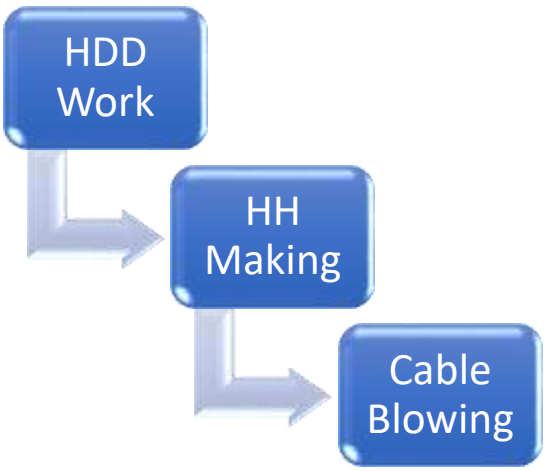

Figure 1. Process of SComm Network Expansion through OFC

Table 1. Market price of basic materials in UG work during 2017-2021

	2017	2018	2019	2020	2021
Pickup	2200	2200	2200	2500	2900
Labor	450	500	550	550	600
Fuel (Diesel)	65	65	65	65	65
Cement	390	455	420	425	535
Sand	38	38	38	54	66
Stone	177	196	175	212	242
Rod	52	65	64	63	85

Horizontal Directional Drilling (HDD) Work

Horizontal Directional Drilling (HDD) is a popular method of installing pipelines in metropolitan settings and for traversing barriers such as rivers and roadways. HDD is characterized as a steerable system that uses surface-balanced drilling equipment to lay pipes, conduits, and cables in a shallow.Horizontal Directional Drilling (HDD) is a technical approach for constructing underground services including cable and pipelines. Initially, it was used to install pipe networks for water distribution or sewage conveyance. Horizontal Directional Drilling (HDD) is now utilized to install infrastructure such as telecom and power cable conduits, water and sewer pipes, oil and gas lines, and so on. The technology has grown over the previous 30 years, beginning as a preferred pipeline building option for crossing big waterways or subsurface surfaces. As the installation involves heavy drilling equipment, it is often more expensive than standard open-cut or manual procedures for the same length of installed pipe. HDD work is one of the most important works SComm. Because the NTTN network length is measured by the length of HDD work.

Figure 2. Horizontal Directional Drilling (HDD) Work

Budget of HDD Work

HDD work is the main part of Underground (UG) network expansion work, and it is the first part of the work which is complex and heavy cost associated. A budget for 1000-meter HDD work has given below.

Table 2. Budget of HDD Work

Particulars	UoM	Unit	Price	Total
Labor House Rent	nos	1	10000	10000
Store Rent	month	1	20000	20000
Lowbed Machine Rent	nos	1	20000	20000
Water	ltr	60000	0.05	3000
Brick	nos	80	11	880
HDD Fuel	ltr	180	80	14400
Pickup Fuel for Mobilization	ltr	120	80	9600
Pickup Fuel for daliy Hdd work	ltr	36	80	2880
Labor Convince	nos	15	700	10500
Store Patrol Duty Manpower (Hired)	nos	4	700	2800
Daily Labor with HDD machine	nos	20	700	14000
Daily labor for pit cutting	nos	10	700	7000
Duct De-coiling and preparation for Duct pulling	nos	15	700	10500
HDD Machine Patrol Duty Manpower (Hired)	nos	4	700	2800
Pickup Toll for Bridge Crossing & Others	nos	2	1200	2400
Pickup 3 Ton (HDD)	nos	12	3500	42000
HDD Machine Maintenance	nos	1	15000	15000
			Total Budget	187760

A budget expressing average year ending material price of 2021 has presented in the table above. The budget has prepared considering a HDD work of 1000 meter in an urban area. Total estimated fund required to complete 1000-meter HDD work is BDT 187,760. That means the expected expense for each meter HDD work is BDT 188. The operation team is encouraged to complete the work within the forecasted budget.

Actual HDD Production Cost

The HDD production cost from 2017 to 2021 has been represented in a table and line diagram which are discussed below.

Table 3. HDD Production Cost Per Meter (2017-2021)

Year	Unit Cost	Change (%)
2017	138.45	
2018	150.45	9%
2019	156.05	4%
2020	168.9	8%
2021	186.2	10%

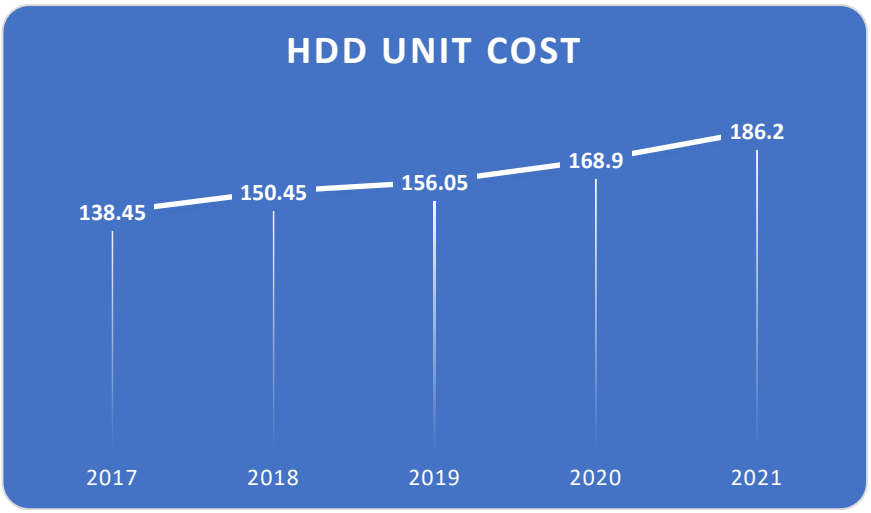

Figure 4. HDD Production Cost Per Meter (2017-2021)

The table and line diagram represent the cost of HDD production per meter during the period of 2017 to 2021. Some of the major civil construction items such as rod, cement, stone, sand etc. Are not used in HDD work. As a result, price fluctuations of those items are not much affect on the HDD production cost. On the other hand, some important component such as pickup and labor are important requirement of the HDD work. Price of labor wages and pickup rent has enhanced a bid gradually over time. So, HDD production cost has increased slowly. The price of HDD production per meter was BDT 138.45 in 2017. After 9% increasing it becomes BDT 150.45 in 2018 and become 156.05 per meter in 2019. In 2020, it became 168.9 per meter and 186.2 in 2021.

Hand Hole (HH) Construction Work

Hand Hole is an important part of network expansion through HDD work. Generally, a Hand Hole build between every 400 meters to 600 meters range which depends on the geographic condition of the area. Patch cord of two duct joined in the hand hole as well as it helps to bring out connection for the main line in order to provide connection to any client and make overhead expansion through pole.

Figure 5. HH Construction of SComm

Scomm Hand Hole (HH) Construction

Every year Scomm has to build lot of hand hole for its optical fiber network expansion using HDD work. The most used RCC HH dimension is (1200x1075x900) mm.

Budget of HH Construction

The budget for making an RCC Hand Cole building at the price of end of 2021 has given below.

Table 4. Budget of HH

Work Type	Unit	Quantity Required	Unit Price	Total Price
Rod for HH and Slab Making	Kg	180	80	14,400
Cement for HH and Slab Casting	Bag	10	535	5,350
Stone for HH and Slab casting	Cft	48	250	12,000
Sylhet Sand For HH and Slab Casting	Cft	35	70	2,450
Labour For HH Making	nos	6	700	4,200
Pickup rent for HH and Slab casting	nos	1	3,500	3,500
Labour for HH Slab Casting	nos	2	700	1,400
Labour for HH Slab placement	nos	-	700	-
Pickup for Slab placement	days	-	3,500	-
Wood For HH and Slab Casting	Sft	3	480	1,440
Sand Filling for HH in	Cft	48	45	2,160
Labour for Sand Fillup cost	Nos	1	700	700
Others Materials/Hardware	nos	1	10,000	10,000
Total Budget				57,600

The above table represents an estimated budget based on market price in December 2021.

To prepare a Hand Hole (HH) we have to use 180 kg rod for hh and slab making and among them 90 kg uses for HH with 12 mm rod and 90 kg for 2 slab with 16 mm and double layer. 10 bag cements for each hh with slab. besides, for each hand hole we requires 48 cft stone for hh and slab casting, 25 cft Sylhet sand for hh and slab casting, 40 cft sand for hh filling. Moreover, we have to keep BDT 10,000 for other materials and miscellaneous.

Actual HH Manufacturing Cost

The HH production cost from 2017 to 2021 has been represented in a table and bar diagram which are discussed below.

Table 5. HH Manufacturing Cost Per Unit (2017-2021)

Year	HH	Change (%)
2017	43620	
2018	53536	23%
2019	44291	-17%
2020	48950	11%
2021	58050	19%

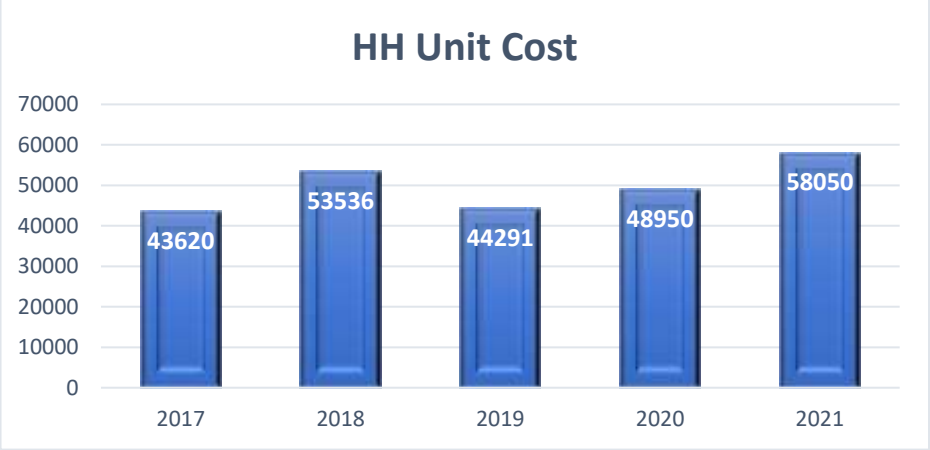

Figure 6. HH Manufacturing Cost Per Unit (2017-2021)

The table and line diagram represent the cost of each number of Hand Hole (HH) manufacturing during the period of 2017 to 2021. It can be said that the cost of each HH has been affected by the change of material's price. Major elements of a HH are Cement, Rod and Stone which price was increased sharply in 2018 which increase the rate 23% and the HH cost raised to BDT 53,536 per unit. The price of construction materials was increase due to L/C issues. The price range of materials back to normal range in 2019 which lead to decline the HH cost by 17% and the stood at BDT 44,291 per unit. But price of most of the materials increased in a large amount in 2021 due to COVID19 Pandemic which leads to increase the price of HH 19% compared to the price of 2020 and the final price stood at BDT 58,050 in 2021.

Cable Blowing Work

Cable Blowing is the last stage of SComm network expansion through underground optical fiber connection. This is comparatively easier and faster work compared to HDD work and HH Building work. As a result, budget for the work is lower than others.

Budget for Cable Blowing Work

A budget for 1000 meters of cable blowing completion has given below. Unit price is considered as per the average market price of the year.

Table 6. Budget of Cable Blowing

Particulars	UoM	Qty	Unit Price	Total Price
Daily Labor	Nos.	7.0	600.0	4,200
Pick up	Nos.	1.0	3,164.0	3,164
Pick up fuel	Km	40.0	22.0	880
Air Compressor Diesel for CB Machine	Ltr	40.0	80.0	3,200
Octene-Honda Power Pack	Ltr	10.0	89.0	890
Power Oil Duct Cleaning Purpose	Ltr	1.0	250.0	250
Jute, Foam Tie	Ltr	1.0	500.0	500
Total Budget				**13,084**

The budget represents the cost of per 1000 meter or 1 kilo meter. Here the cost per kilometer is BDT 13,084 which mean that cost per meter is BDT13.08.

Actual CB Production Cost

The CB production cost from 2017 to 2021 has been represented in a table and line diagram which are discussed below.

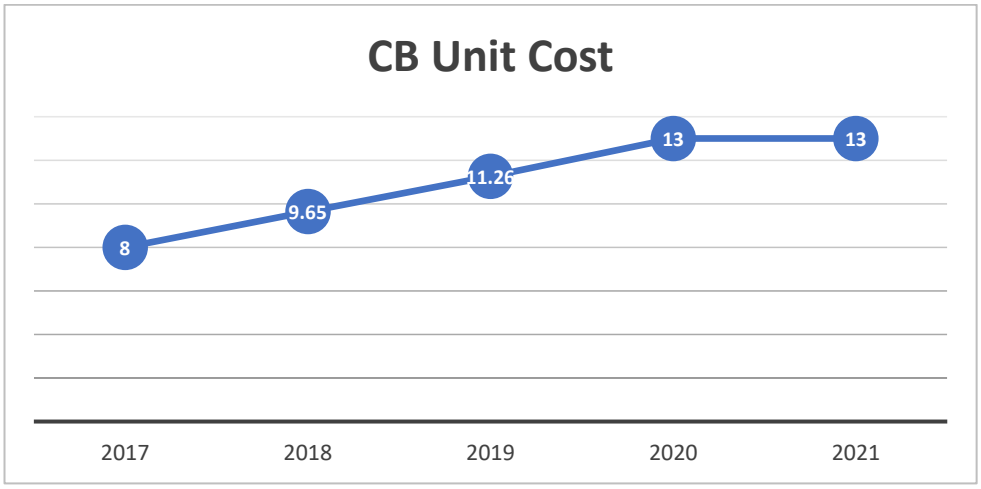

Figure 7. CB Unit Cost (2017-2021)

Table 7. CB Unit Cost

Year	Unit Cost	Change (%)
2017	8	
2018	9.65	21%
2019	11.26	17%
2020	13	15%
2021	13	0%

The line diagram and the table represent the Cable Blowing cost per meter during the period of 2017 to 2021. The cost was BDT 8 in 2017. It- was increased rapidly in 2018 by 21% and become BDT 9.65 per meter. It was increased by 17% in 20192, 15% in 2020 by becoming BDT 13 per unit and the price is remain unchanged in 2021. Price of rod, cement and stone increased a lot during 2020-2021 but those materials are not used in CB purpose. Price of materials used in CB remain comparatively unchanged during the period. As a result, unit cost was not increased in the year of 2021.

Major Findings

There are some issues that may cause both costs increasing as well as delaying in work completions. Some major findings are discussed below.

Rented Vehicles: Different types of vehicles are required for project works. Three pickups is a mandatory requirement for HDD work and Hand Hole manufacturing. Two pickups always attached with each HDD Machine in order to carry water tank and pipe, and one pickup required for HH materials and shutter carrying. Sometimes it is difficult to arrange vehicles in short time which is responsible for delaying of work. Besides, rent of pickup is much higher than actual cost.

Small Purchase Quantity: The Company conducts different types of network building all over the country. Generally, most of the materials are purchased from local retailers. As a result, price of the materials is being comparatively higher.

Labor Team Dependency: Scomm uses some selective labor team for its network building works as there are some technical experiences required. As a result, there are less negotiation options during labor hiring for project work which is a barrier in cost minimization.

Inter-Department Collaboration: There should have proper collaboration between the Operations and Corporate Affairs Department. Because sometimes operations and related departments prepared for project work but after reaching the work area they find that the work permission is not approved for the local authority yet which increases project cost and duration.

Scatter Work Plan: SComm has to conduct various network expansion work all over the year. Some of the work planned have a long time in hand. But most of the works conducts separately. As a result, some fixed cost such as vehicle movement expenses and labor conveyance etc. require which rise the project costs a lot.

Recommendations

Based on the analysis of the report as well as real-life work experience in the organization, some solutions and suggestions will be discussed which might reduce various problems as well as increase profitability by reducing costs.

Own Vehicle: The company can buy some own vehicles as vehicles are required regularly for network expansion work. It will help to reduce transportation cost associated with network expansion.

Purchase from Company: In large projects, SComm needs huge amounts of rod, cement, stone etc. If it can purchase those materials directly from company or prime suppliers, then production cost will be reduced a lot.

Search More Labor Team: SComm have to search for more labor team for its work which will reduce monopoly among labor team and reduce production cost.

Work Under Project Manager: If all department work under a single project team then cross-functional work will be smoother,

Combined Budget: If the company can predetermine the project work in similar area earlier and prepare combined budget for those work then unnecessary fixed cost such as store rent, pickup rent, labor conveyance etc. will be reduced and production cost will be decreased which will maximize the profit of the company.

CONCLUSIONS

This paper emphasizes Summit Communications Limited's pivotal position in the network and internet service industry, marked by rapid growth. The company's consistent need for network expansion, device upgrades, and ongoing maintenance demonstrates its dedication to operational excellence. Central to its operations is network expansion, vital for internal function and revenue through leasing. Recognizing the network as capital investment highlights the need to streamline expenses.Optimizing network costs offers the potential for cost reduction and revenue growth. Insights and findings here aid informed decisions. Historical trends and comprehensive data support budgeting, cost analysis, and auditing.Challenges include limited financial data sharing and data availability constraints, affecting depth. Assumptions mitigated yet may introduce uncertainty. Limited website data may impact the analysis scope.For future researchers, collaboration for data access and mixed methods for insights are recommended. Balancing surveys with interviews may reveal comprehensive material price dynamics. Finally, optimizing network expenses remains Summit Communications Limited's goal. Insights in this paper offer a starting point. Amid dynamic network services, these insights guide efficient operations and lasting financial stability.

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