

FIBER OPTIC COMMUNICATION AND ITS FUTURE IN SRI LANKA

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ABSTRACT: The Power of Light is the Future Fiber optics specialized fibers that are capable of carrying transmissions made of pure light. Everywhere on this planet fiber optical modes are pivotal in telecommunication skeleton for the entire planet-wide broadband networks. With that, significant channel width in signal transmission along with desirable no latency is a cardinal element in current context. Fiber optic hairs accommodate substantial plus blooming transmission bandwidth with very low latency, and hence are now the transmission medium being higher order wants for positive distance and wide enough data rate telecommunication networks. Thus and thus, howsoever my writing here emits an outline of fiber line communication systems enveloping their well-named technologies, and furthermore speaks on technological trend in the direction to the next generation at the perception of universal domain to the Sri Lanka. By and large, the superiority of fiber cables for transmitting information replaces the old technologies. The present utilization of the fiber optic system can be seen across the Telecommunication Service Providers implementation and all the likelihood would settle the potential new appearance in the middle of the fiber lay-outs. In furtherance, nonetheless of very latest fiber technologies are in place off Sri Lanka, whose applicability in the local dimension looks into the future to come as being of number of years.

Keywords: Fiber Optics Usage, Evolution, Sri Lanka

1. INTRODUCTION

More often than not, the primary factor that paves the significant utilization of fiber optics in the Sri Lankan context is to therequiredinformation capacity and the blazing access speed at the expense of losses. Quite thus the fibers better can outdo the other transmission lines. To the precise degree, the most likable feature in the environment of futuristic optical networks is the tendency to process information wholly in the optical coordinates aimed at amplification, multiplexing, de-multiplexing, switching, filtering, and optical signal processing and more over the last is more efficient than electrical signal processing plus et al. High rates of data flow, noise avoidance and electrical isolation are a number of the important characteristics that shapes fiber optic technology appropriate for industrial and profitable systems. This technology has exerted phenomenal growth during the course of the last twenty-five years of the planet.

The information throughout the channel essentially being digital nature, an optical fiber anatomy is a dielectric cylindrical waveguide made from dielectric materials. The core of the waveguide is found to be higher in refractive index than that in the outer cladding, in order that light pulses lead along the co-centric axis of the fiber by means of a wave phenomenon of total internal reflection. The like communication systems constitutes an optical transmitter to convert an electrical signal to an optical signal for transmission through the optical fiber, a cable containing several bundles of optical fibers, optical amplifiers to boost the power of the optical signal, and an optical receiver to decode the received optical signal back to the original information signal. Figure 1 gives a simplified description of a basic fiber optic communication system.

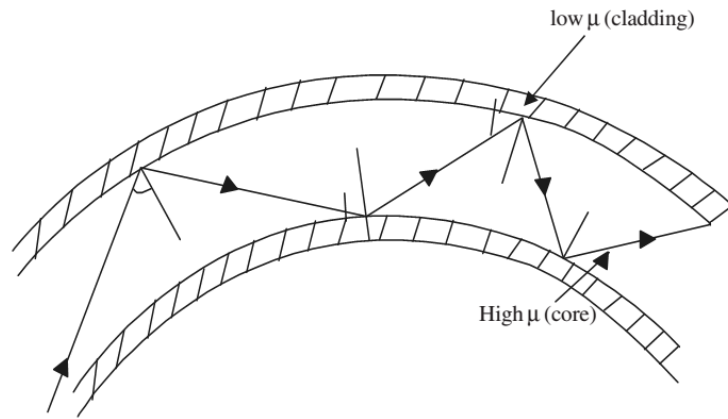


Fig.1. Fiber Channel Anatomy

2. METHODOLOGY

The methodology was based on the comparative reflective learning philosophy model arising out of present literature plus, personal interviews and questionnaire in communication with some intellectualities and heavy user social groups of a degree to the appreciations. The results of the tools were critically analyzed and only later the outcomes were released.

2.1 Acclivity of Fiber Optics useable in the Sri Lankan Context

Noise Immunity, Electrical Isolation, Low Error Rates, Safe for Use in Hazardous Areas, Wide Bandwidth, Low Signal Attenuation of good quantity in comparison, Light Weight, Small Diameter, No Crosstalk, Inherent Signal Security are literarily the enhanced positive factors to ascendancy of primacy in the practicum of optical fibers.

PRESENT FIBER OPTICS IN SRI LANKA

a. The perquisite of fibers is experienced on the Sri Lankan ground through Dialog Service provider. Bay of Bengal Gateway Submarine Cable at Dialog's Cable Landing Station in Mount Lavinia seeks placeable gravity. Dialog Axapta PLC spoke out the connection of Sri Lanka to the Ultra High Capacity 100G-PLUS Bay of Bengal Gateway (BBG) Submarine Fiber Optic Cable via its state-of-the-art Cable Landing Station (CLS) at Mount Lavinia (South Colombo). To the Same Degree, the new Cable System would passage over 6.4 Terabits per second (Tbps) of worldly bandwidth to Sri Lanka. In extra that would amount a prestigious put-up in account of communication propagation fastness, the same will yet more accelerate an incomparable connectivity position joined on par with a multiplicity of networking probabilities for the sake of Retail Consumers and Enterprises Besides to providing Sri Lanka's Connectivity eco-system with the single largest influx of International Bandwidth, the BBG cable will also inject further speed and capacity to Dialog's state-of-the-art 3G HSPA+, 4G and Fiber Optic networks. The BBG investment also sets as Dialog's commitment to present the best in connectivity and the enterprise solutions to Sri Lankan businesses. Dialog recently commenced off its best-in-class business cloud services portfolio, which will be further into robust infrastructure in terms of global connectivity via the BBG [1, 3].

b. Not less than the above, Sri Lanka Telecom (as the most users of fiber optics in Sri Lanka) has too engrossed unto the fiber installation in the segments of manifold as names appear: Under Sea / Ground Cabling projects to the best percentage.

In 2014 SLT promulgated its collaboration among 15 international telecommunication operates arising out of 17 countries, in the format of to intensify the South East Asia – Middle East – Western Europe 5 (SEA-ME-WE 5) state-of-the-art undersea cable system [1,3].

Nevertheless, the Sri Lankan fiber system ought to comprehend quite a more well in near on amount of compliance the universal trend, eventually globalization is of solidified level off the part of the country. In essence my propositions out of this research finding of all succeeding modernized technologies would be able to enunciate good space aimed at the best optimized engulfment of the fibers in Sri Lanka.

2.2. FUTURE

a. *Intelligent Optical Transmission Network*

Traffic engineering, dynamic resource route allocation, special control protocols for network management, scalable signaling capabilities, bandwidth on demand, wavelength rental, wavelength wholesale, differentiated services for a variety of Quality of Service levels, and all the rest would attribute to the betterment of the optical line application of acme. Time would be made until the implantation of the Intelligent Optical Transmission Network [4].

b. *Ultra – Long Haul Optical Transmission*

Cancellation of dispersion effects enables researchers to study the potential benefits of such propagation. More understanding of the interactions between the electromagnetic light wave and the transmission medium is vitally receptive in here.

c. *Improvements in Laser Technology*

Moreover, present semiconductor lasers can be pragmatised to a wider variety of lasing wavelengths for the wanted dimension. Shorter wavelength lasers with very high output powers are of interest in some high density optical applications. The means in that the laser is controlled such way it undergoes a abrupt change to the wavelength upon injection of a pulse, whereby the chromatic dispersion felt in the pulse be lowered. There is amelioration to develop instruments to be used to characterize such lasers. Plus, single mode tunable lasers play vital role to the coherent optical systems in the domain of the future. The former can be of turned positions to the frequencies [5].

d. *Laser Neural Network Nodes*

This is an efficacious possibility in the Lankan context for the realization of optical network nodes. A hardware topology operable in the optical domain, further the use of ultra-fast photonic elements finds desperation to raise the capable capacity and the relevant transfer speed of telecommunication nodal networks. As optical networks become more complex in the future, the use of optical laser neural nodes can be an effective solution.

e. *Polymer Optic Fibers*

Polymer optical fibers subject the operators to a number of good factors in desirable comparison with the channel propagations, to name a few, copper cables, air and glass fiber. In the concern of glass optical fibers, the polymer lines cater the needfulness of a relaxed with less costly processing of signals around optical domain, and that way plug interconnection rests at ease. Polymer optical fibers as the transmission media for aircrafts is indeed would fall under research platform owing to the available positivities. On the whole the old version of cables in Sri Lanka can be of replacement with the Polymer Optical Cables [6, 7].

F. *High – Altitude Platforms*

On the present coordinates, optical inter satellite links and orbit-to-ground communication channels up and down; the last has vulnerability to bad weather conditions. The existential theoretical and experimental investigative research deepens optical communication from high altitude surfaces. High-altitude membrane can hold stations at heights of 16 to 25 Km. The country of talk is quite a way behind at the future's implementation of this.

G. *Advancement in Optical Transmitter/Receiver Technology*

High quality transmission in optical pulses at the cost of distortion and undesirable signal to noise ought to be apprehended in the aforementioned flow. The optical scientific exploration accounts for the innovative inventiveness of such practicum. Next forth, better error correction codes are likelier to be available in the nearest future. All in all, the contextualization may put out Sri Lanka to the time to come [9, 10, and 11].

H. *Advancement in Network Configuration of Optical Submarine Systems*

Optical submarine communication systems like the development of a technology for configuring the mesh network at a local geography. The ring configuration is very much common in the above systems in the context of now. Signal branching in wave length domain is essentially triggered by the optical add/drop multiplexing putting into existence of mesh network topology whose all the way direct connection transfer information back and forth faithfully. Higher order research mindedness prevails in the middle of the Scientific Optical Community of the Earth thence strolling down into the Sri Lankan territory at the likable nearest.

I. *Betterment to Wavelength Division Multiplexing*

The agility of research runs across as to how to extend the wavelength range over which wave division multiplexing can be operable. In the present contextualization, the wavelength window that is also of C band numbers in the neighborhood of 1.53-1.57 μm as to be of a good plunge. Low loss window influences a production to 1.30 – 1.65 μm is presently termed dry fiber. All pulled off, optical filtering is intended as concrete for the Wave Length Division which is realizable one good time of Sri Lanka in the futuristic framework.

J. Fiber Design Enhancement en route Small Scalability in the Physicality

By means of controlling the amount of impurities either in addition or removal the light transmitting characteristics of fiber glass can be altered especially the speed of the transmission. That way desirably the glass fibers can be moderated so as to meet the specific traffic engineering requirement to a situation. The conception can be contemplated in the futuristic dimension, for the sake of reliability and effective glass fibers. Thence the components associated with the fiber domain are in a positive likelihood to come down in the physical sizes namely miniaturization. Sri Lanka's adoptability pleases its coming into being at the time *acme* [9, 10, and 11].

3. CONCLUSIONS AND GENERALISATION

To the despair, Sri Lanka is a slow learner at absorption of technologies. Nonetheless it heads off in elemental path. Albeit with what has been said, a large degree of activities are yet to be carried out to bolster speedy data bits, enhanced versions of switching styles and of more intelligent communication structuralism that would naturally modulate the fashioning terms of elements such as traffic patterns and the like at the same quite time further staying cost-efficient – in spite of Sri Lanka being backed off around the devising of the connected technologies well with the aforesaid. Very largely, the timely flow is anticipated to move on towards the futuristic coordinates well like paradigm shift better aimed at experimentality as to be traversed to the realization whence on the road to uninventive theories in fiber optics communications. On the whole in the exactitude, fiber optics predominantly in the present days occupies and will continue to place the same in the Sri Lanka Telecommunication Industry [6, 7, and 8].

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