Future Visions for Advanced Communications & Information Technology Based Applications and Infrastructure

Stuart Lipoff
Arthur D. Little, Inc.
Cambridge, Ma 02140 USA
(617) 498-5000
www.adltechnology.com
www.lipoff.org
s.lipoff@ieee.org

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Arthur D Little

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Abstract

Title: Future Visions for Advanced Communications & Information Technology Based Applications and Infrastructure

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By: Stuart J. Lipoff, V.Pres. and Director of Communications, Arthur D. Little, Inc.

Abstract:

Deregulation, hypercompetiton, globalization, convergence, and advanced multimedia telecomputing technologies are powerful forces driving the rapid growth of wired and wireless broadband public telecommunications infrastructure. Only a few years ago, multimedia capable communications circuits and communications devices were restricted by cost to large businesses, and further restricted by size and weight to the desktop. However we now find millions of US homes with affordable broadband connectionless cablemodem or ADLSL services and 3rd generation wireless systems only a few years from being deployed along with compatible pocket and personal portable terminal devices. This presentation will explore some alternative infrastructure visions for public communications networks, home networks, as well as the connected consumer electronics devices that terminate these networks. Following identification and description of the infrastructure the presentation will showcase several broadband and multimedia rich applications scenarios for entertainment, transactions, information, education, and communications. Key enabling technologies will be explored such as advanced man-machine interfaces, digital rights management, and AI based agents.

Objectives & Outline

The purpose of this presentation is to provide a common framework of definitions and a common factbase to facilitate discussions

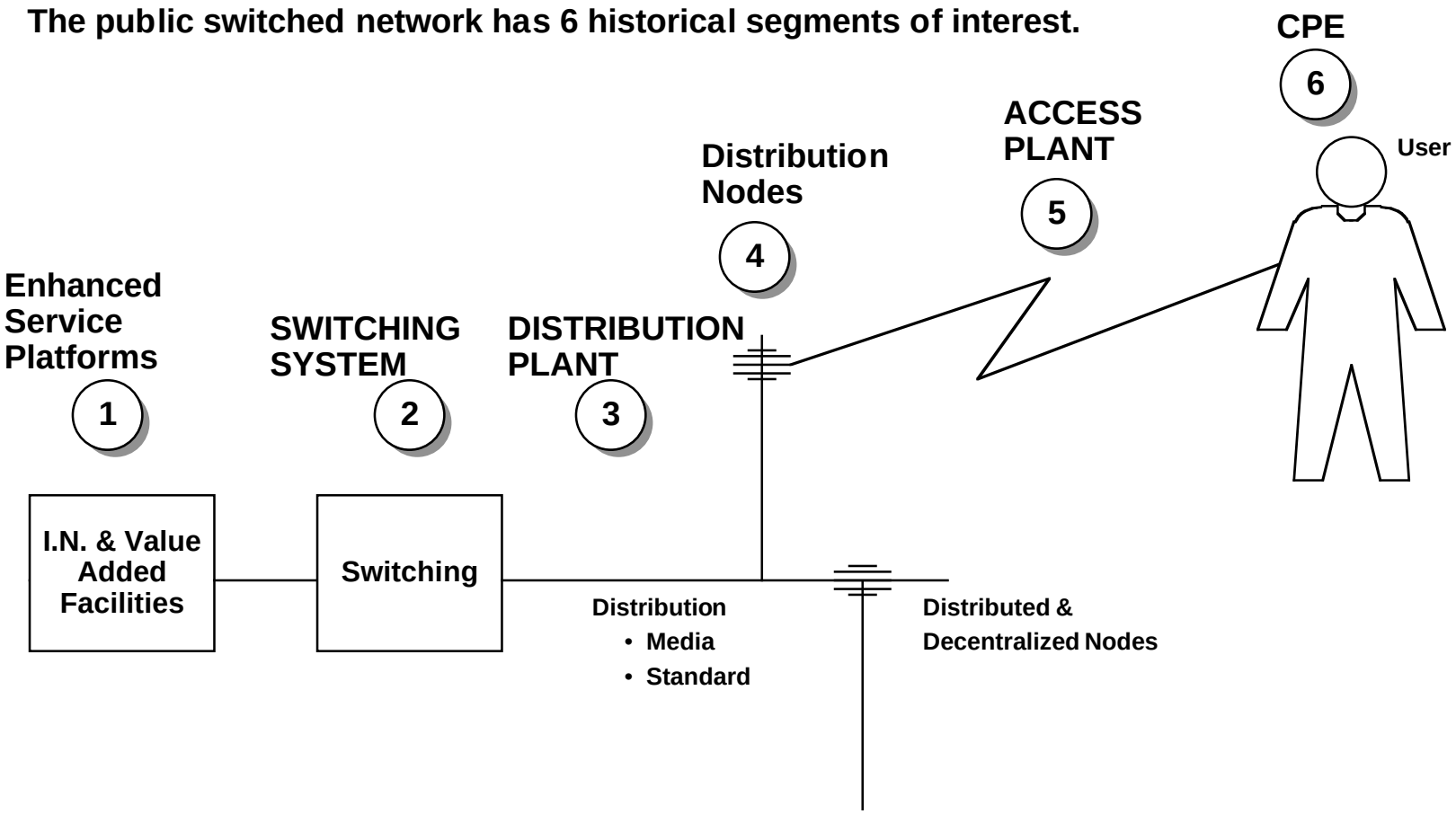
- Historical Evolution
- Key trends & drivers
- Infrastructure alternatives
- Applications Examples

The general trend has been to increase bandwidth & migrate electronics and intelligence to the edge of the network

EVOLUTION	ACCESS PLANT	DISTRIBUTION PLANT	SWITCHING SYSTEM	INTELLIGENT NETWORK
	Wire/SDM	Wire/SDM	Central/Analog Circuit Switch	Class Services
	Same	Wire/DLC	Central/Digital Circuit Switch	Same
	Same	FO/DLC	Same	2nd Generation
	Same	Same	Distrib./Digital	+Cellular Integration
	Wire/ISDN	Same	Same	Same
	Fibre Curb	Same	Distrib./Digital VoIP Packet	+Video+Voice+INet
	Fibre Home	Same	Same	Same
	PCN Radio	Same	Same	+3rd Generation PCN

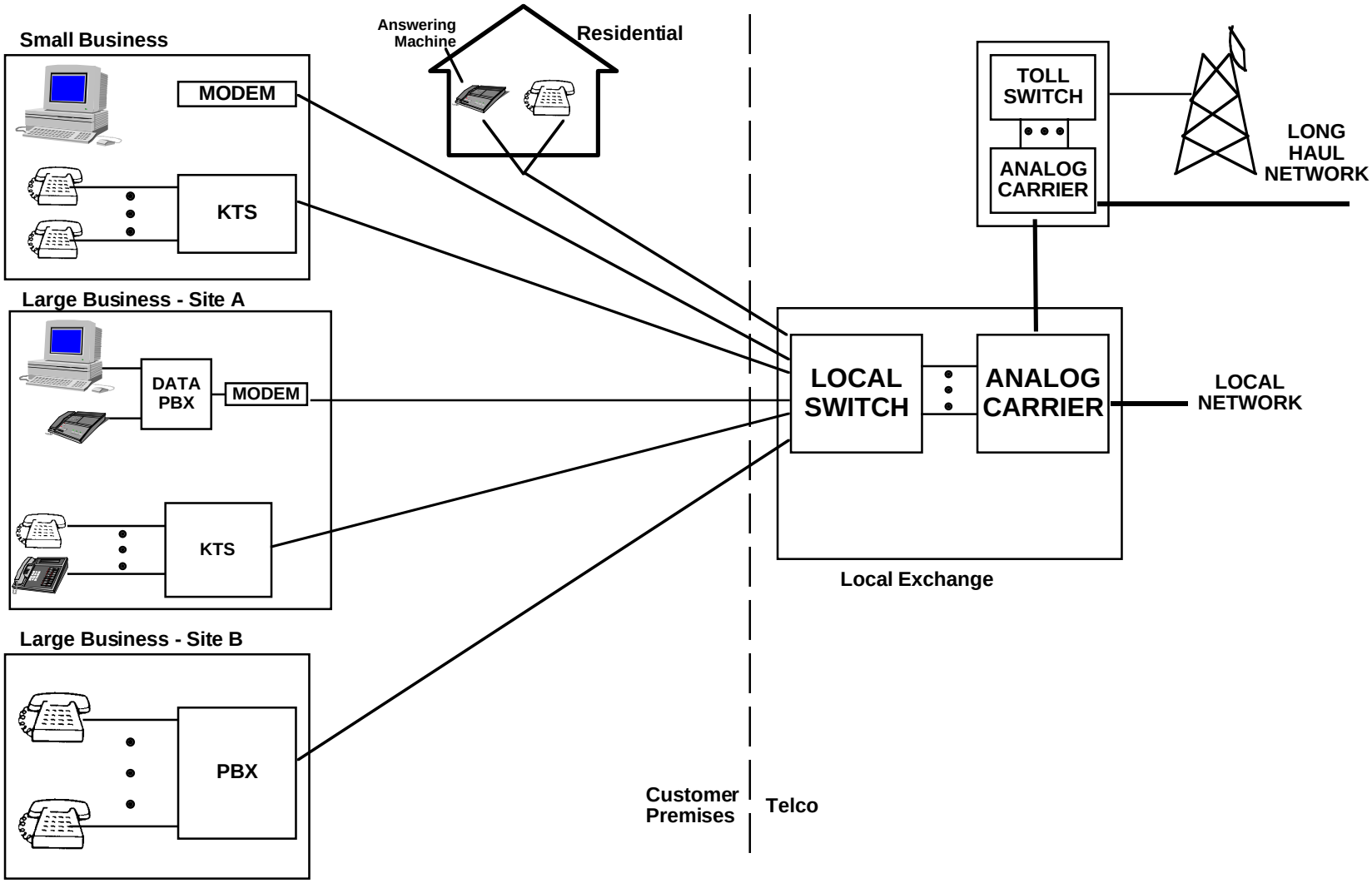
Historical Evolution of Public Networks Segments

The public switched network has 6 historical segments of interest.

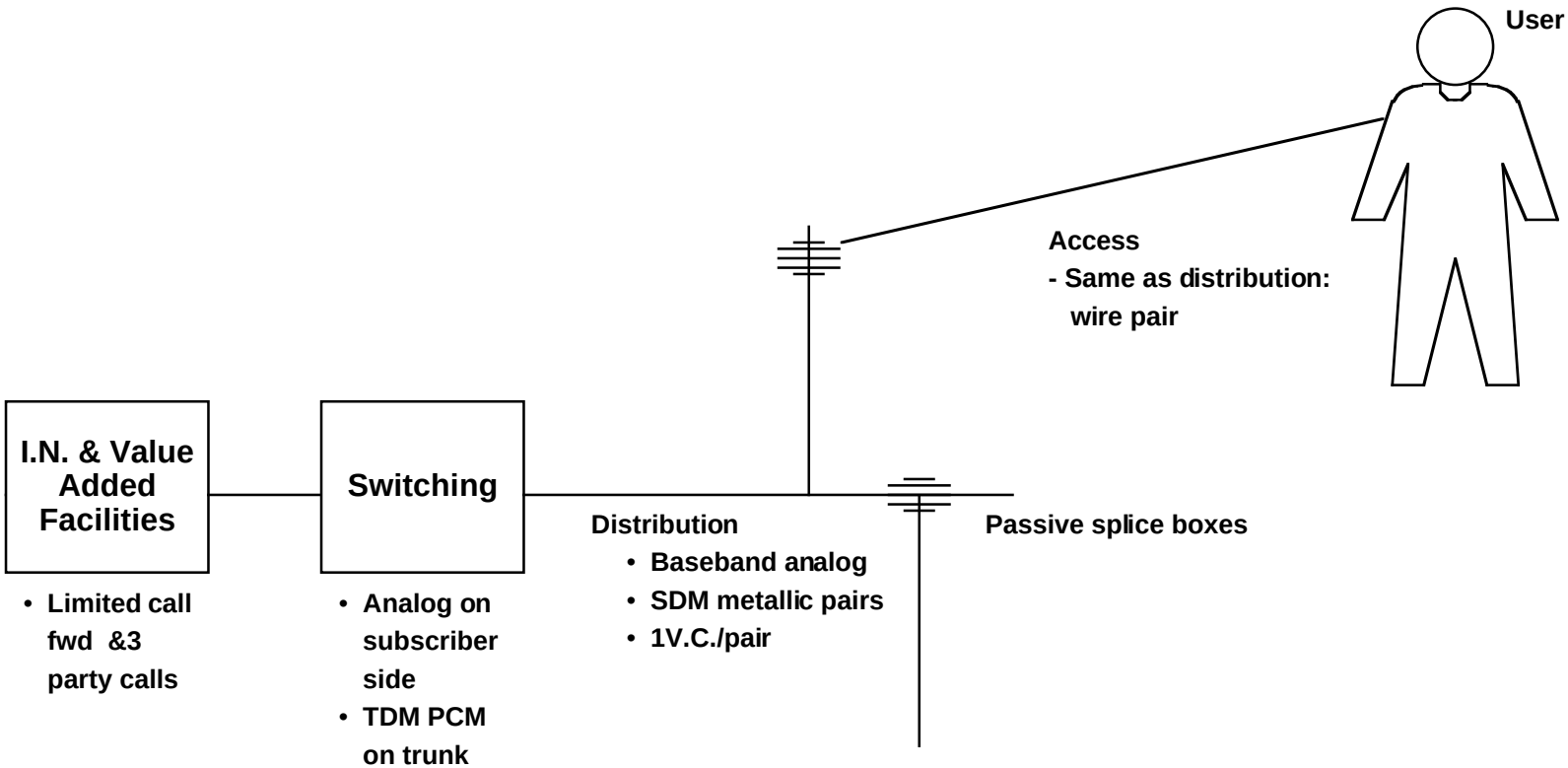


ANALOG NETWORK TECHNOLOGIES

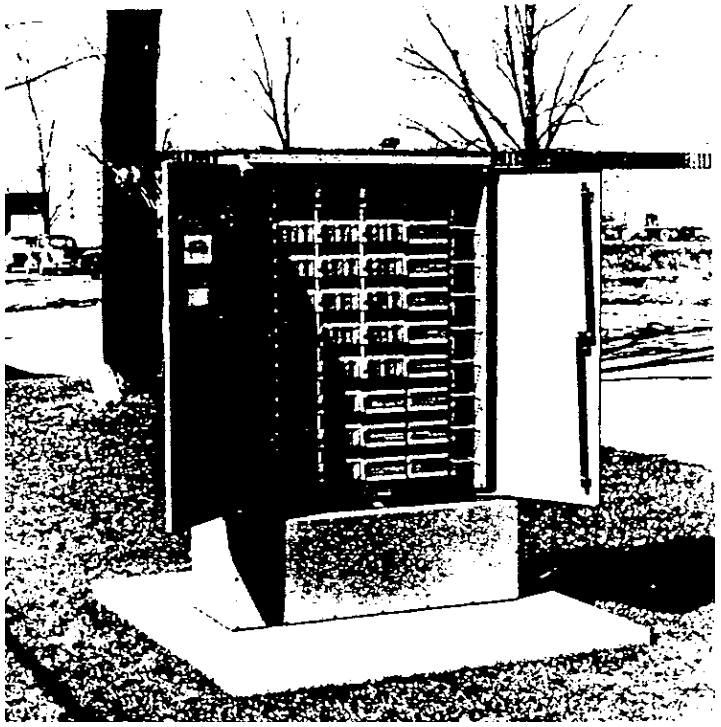
The original Analog Network is as follows:



The distribution and access plant is a wire pair of 1 voice circuit per pair.

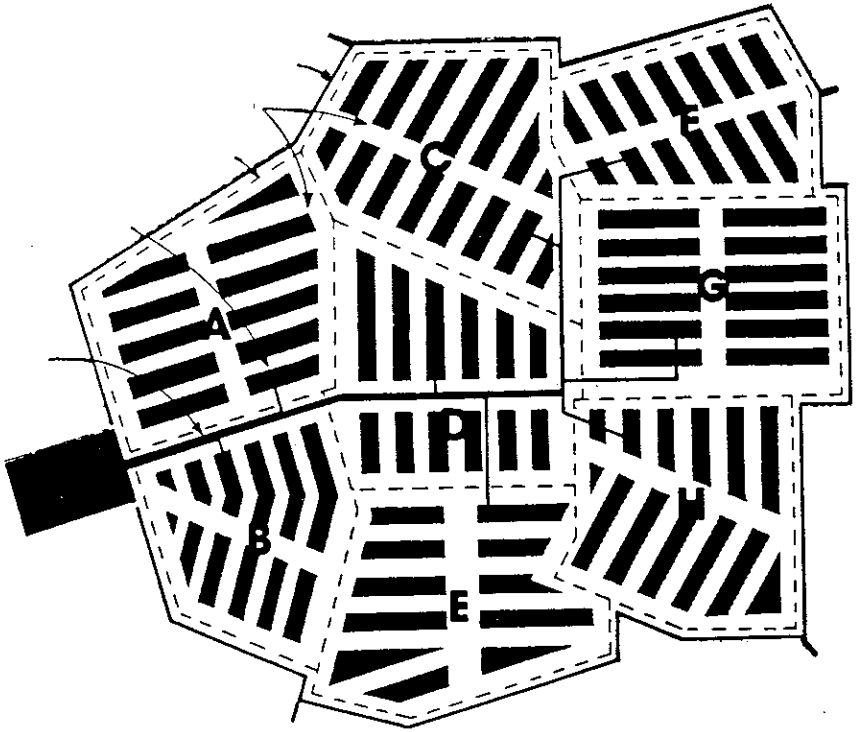


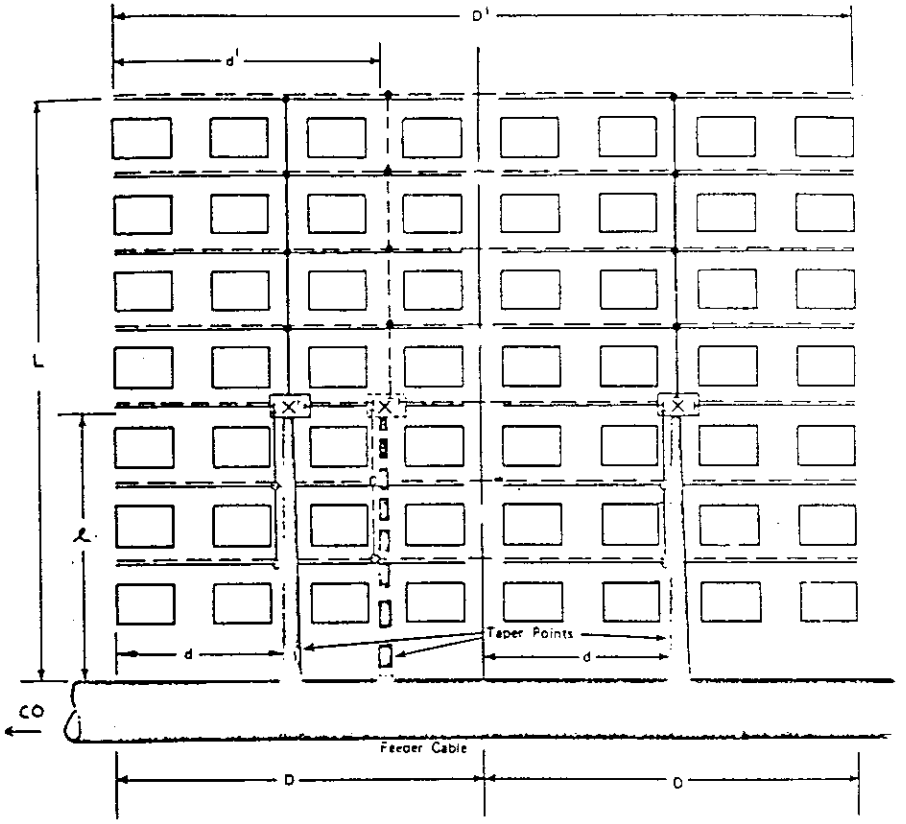
The S.A. concept provides a transistion from distribution to access plant



The S.A. concept divides the access regions into about 0.5 miles radius areas

SERVING AREA CONCEPT



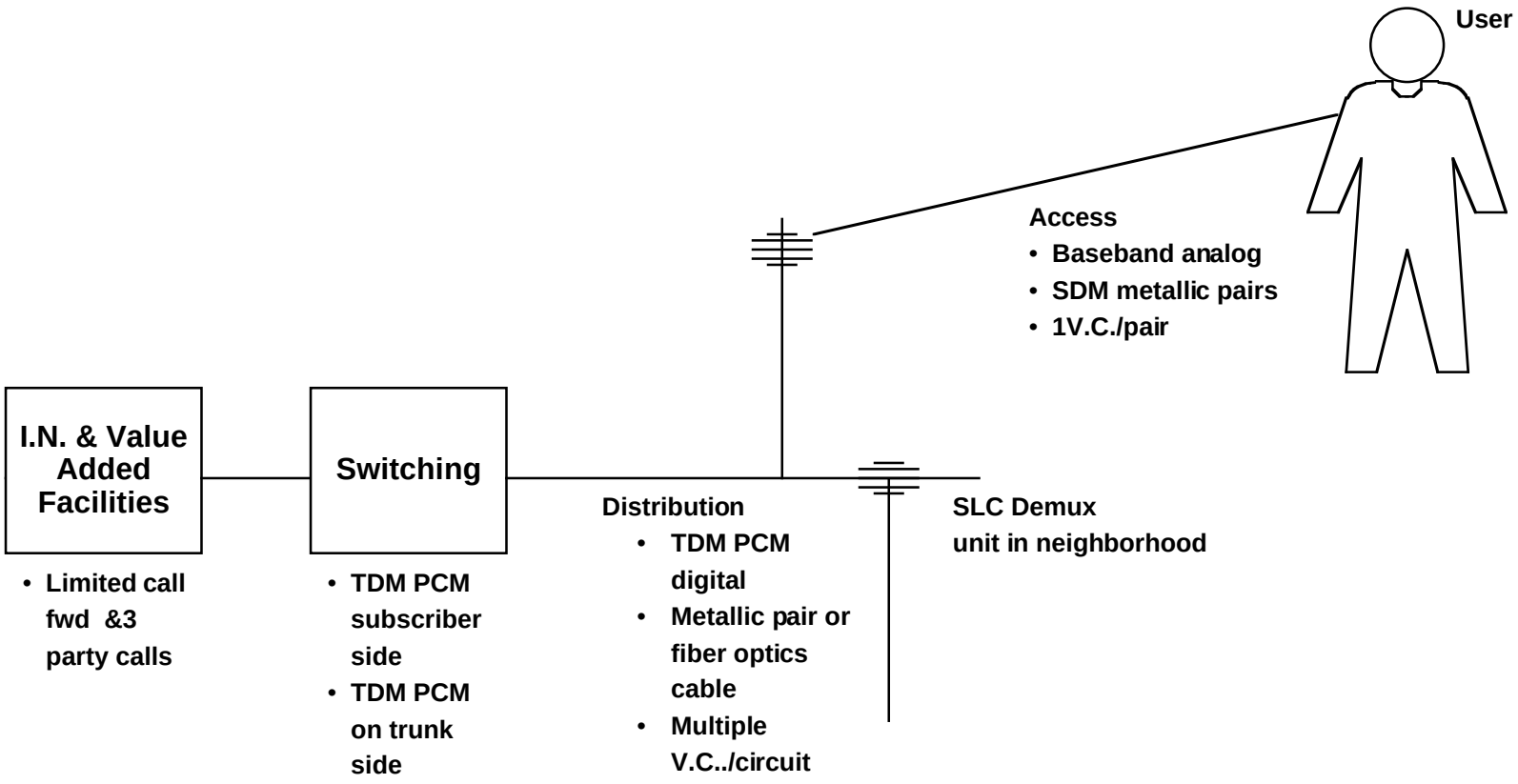


Legend: Single Serving Area — Two Serving Areas (High Density)

Distribution Cables

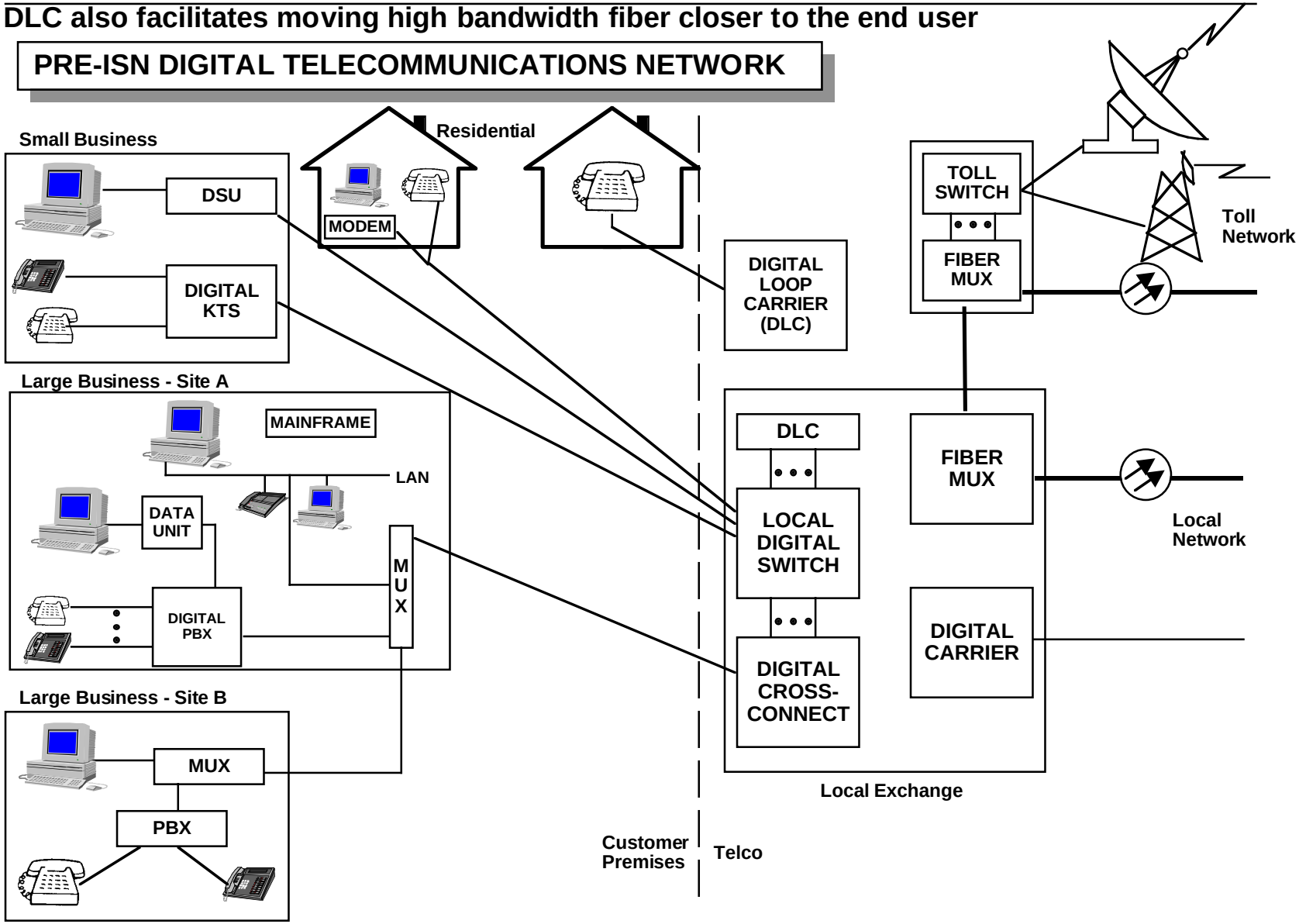
Lateral Cable

With DLC the electronics starts to move closer to the end user

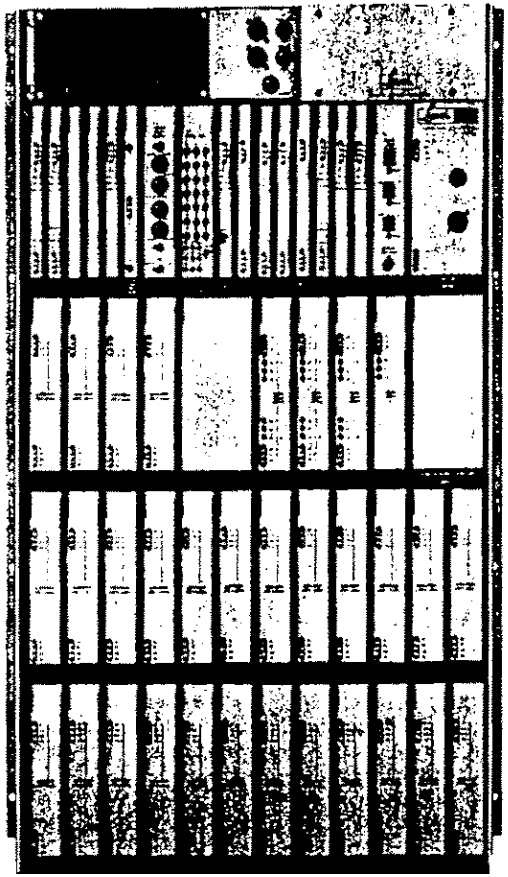


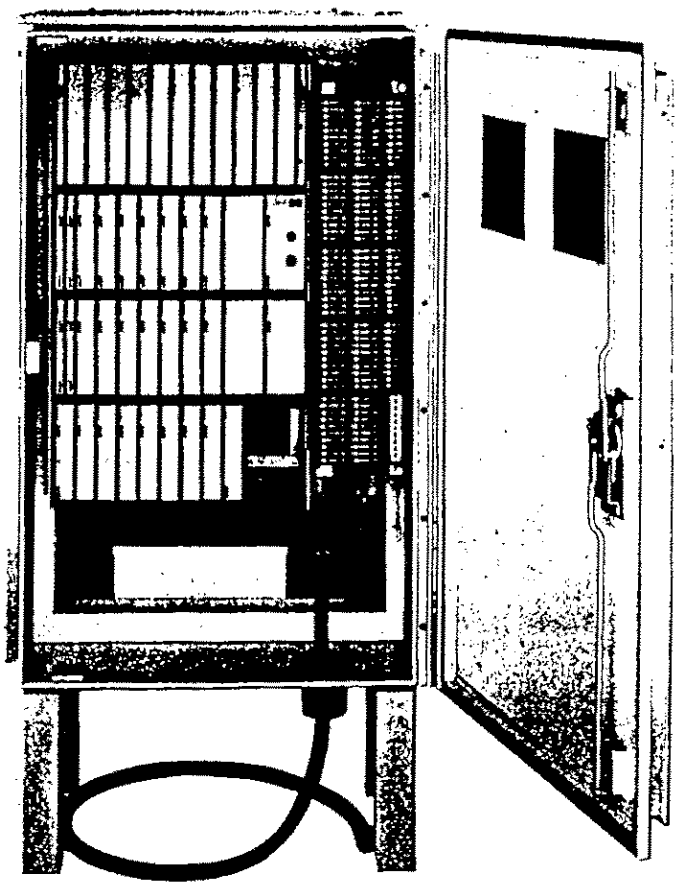
Historical Evolution of Public Networks Digital Loop Carrier/Subscriber Line Carrier

DLC also facilitates moving high bandwidth fiber closer to the end user

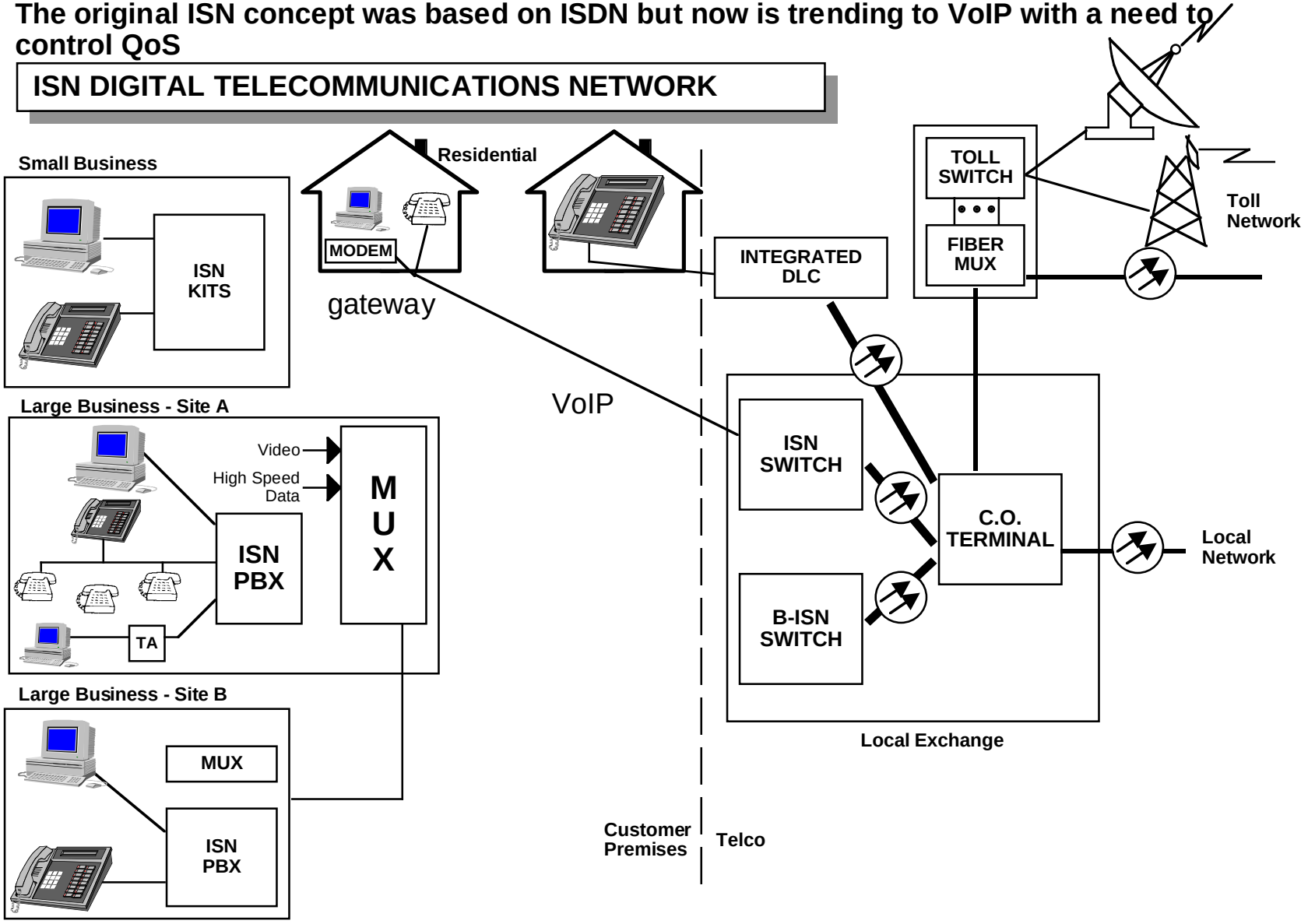


With the SLC electronics in the field powering and environmental protection is required

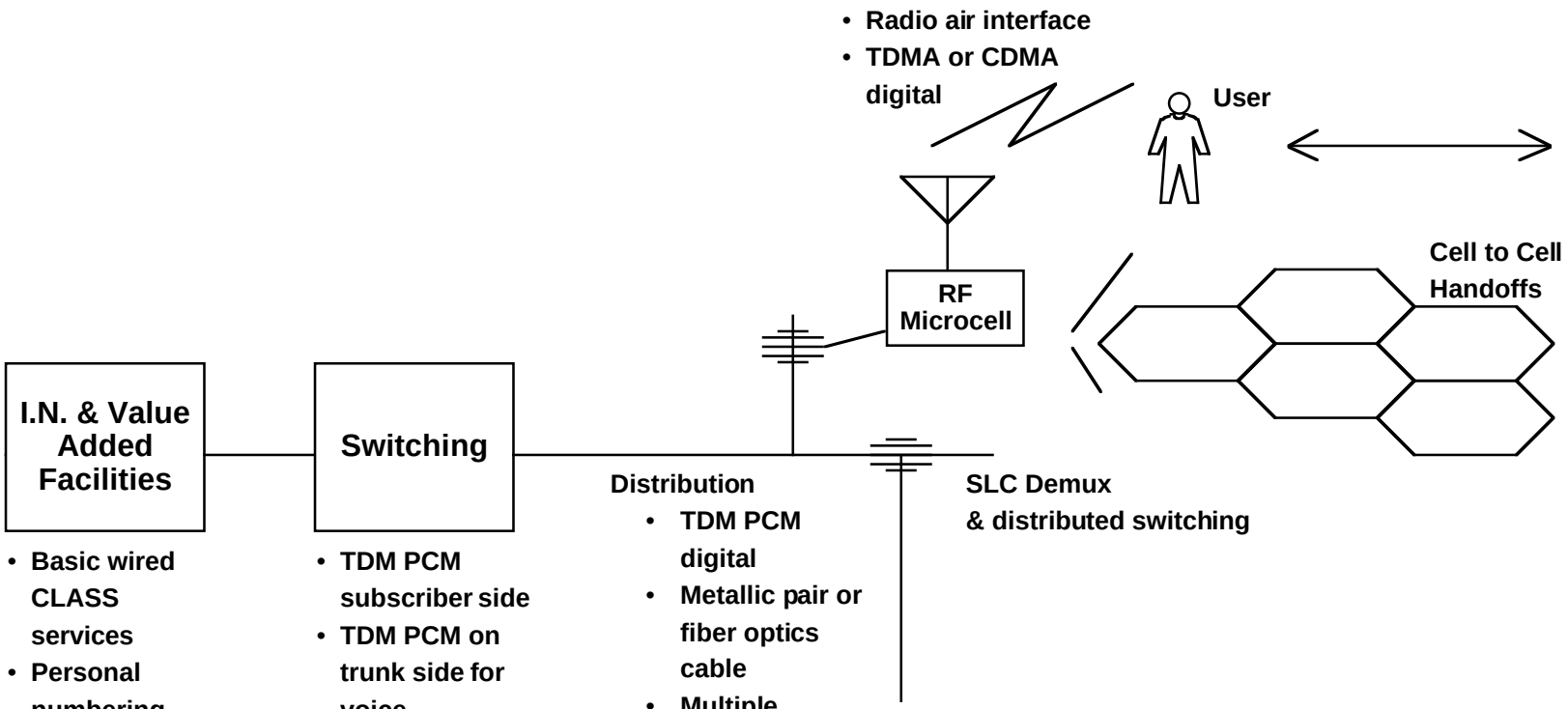




The original ISN concept was based on ISDN but now is trending to VoIP with a need to control QoS

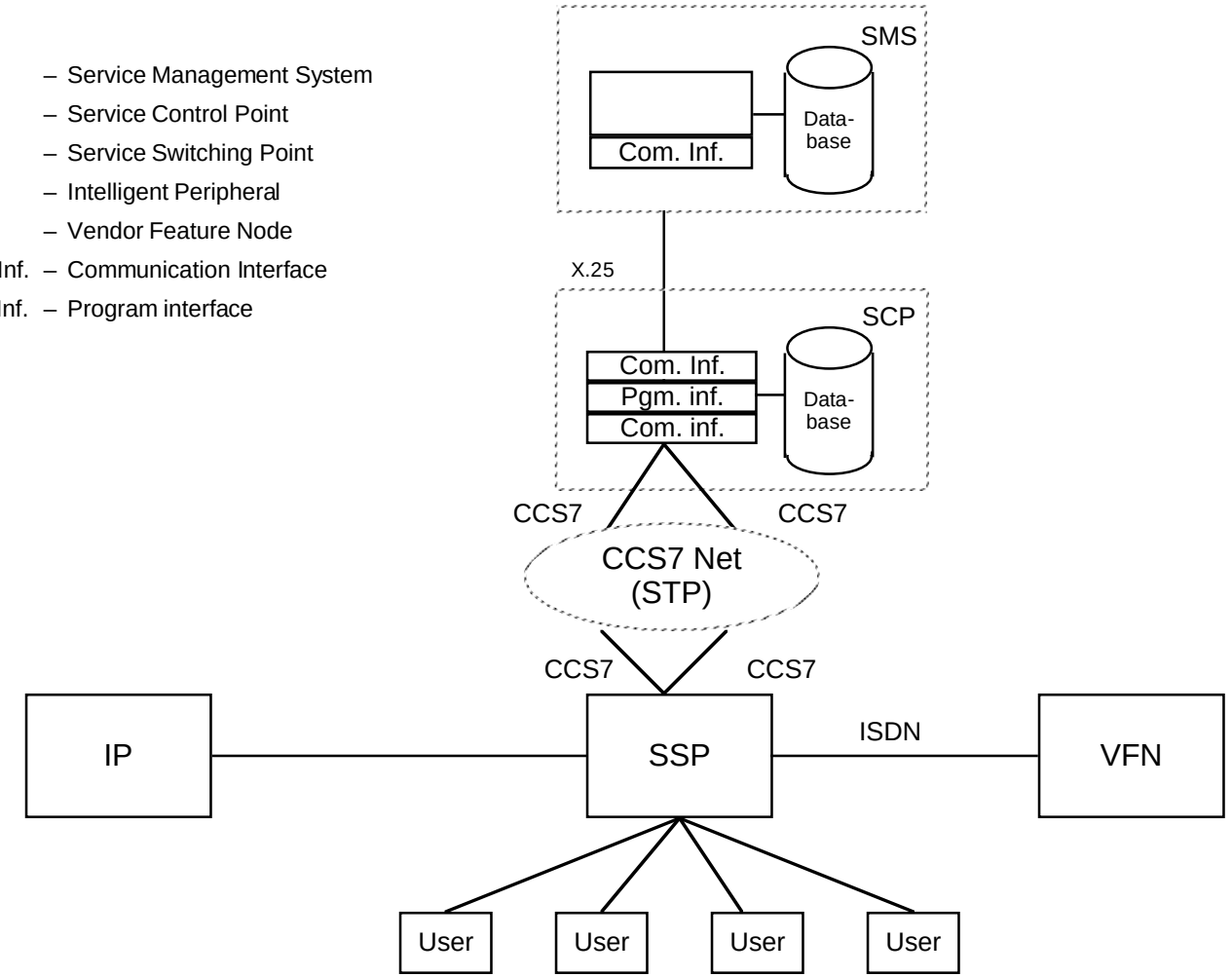


These networks are now competitive with wired networks with the benefits of mobility

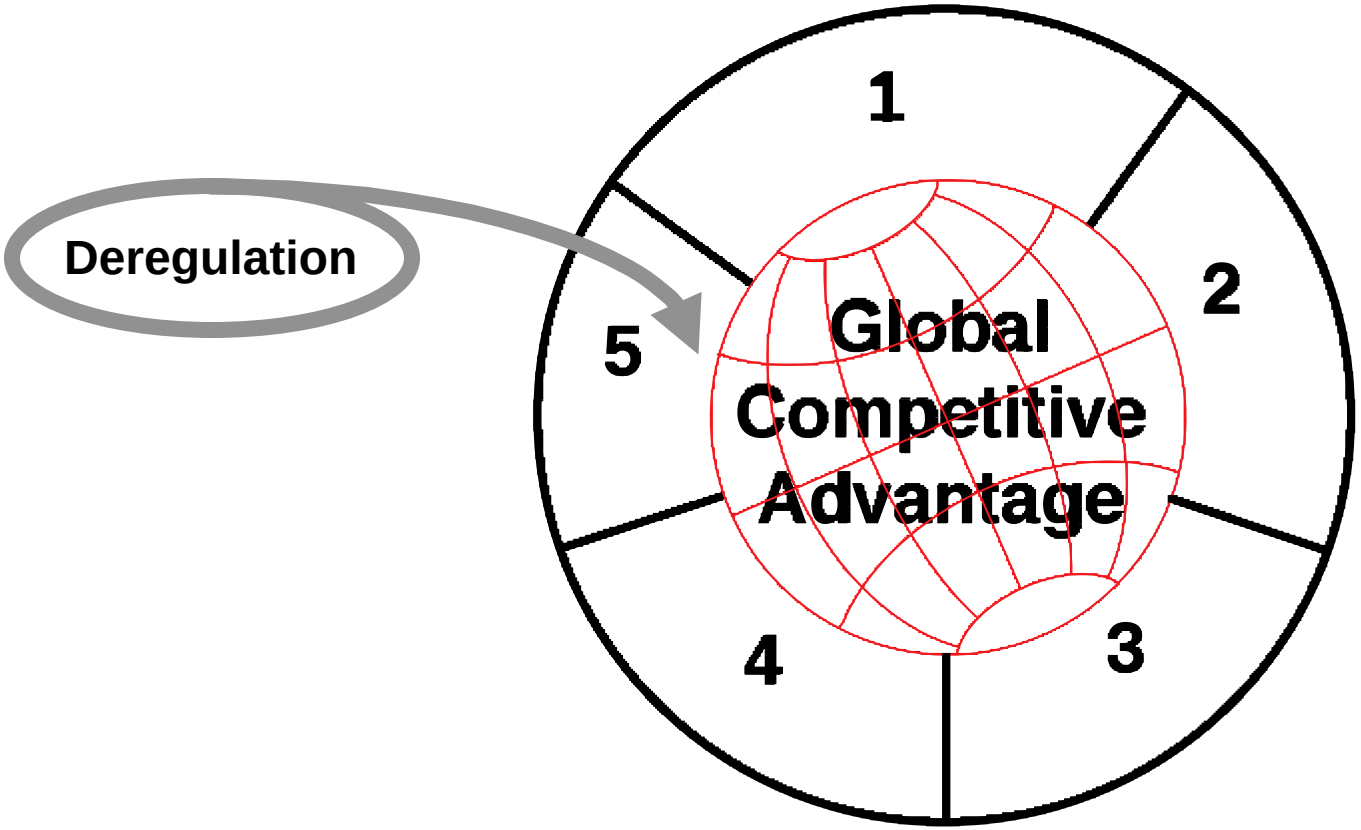


In parallel with access and distribution trends was the development of IN and AIN for delivery of enhanced services

SMS – Service Management System
SCP – Service Control Point
SSP – Service Switching Point
IP – Intelligent Peripheral
VFN – Vendor Feature Node
Com. Inf. – Communication Interface
Pgm. Inf. – Program interface



Emerging technologies are providing the basis for 5 key themes which in turn are changing the fundamental basis of competition for both service providers, equipment suppliers, and strategic end users alike



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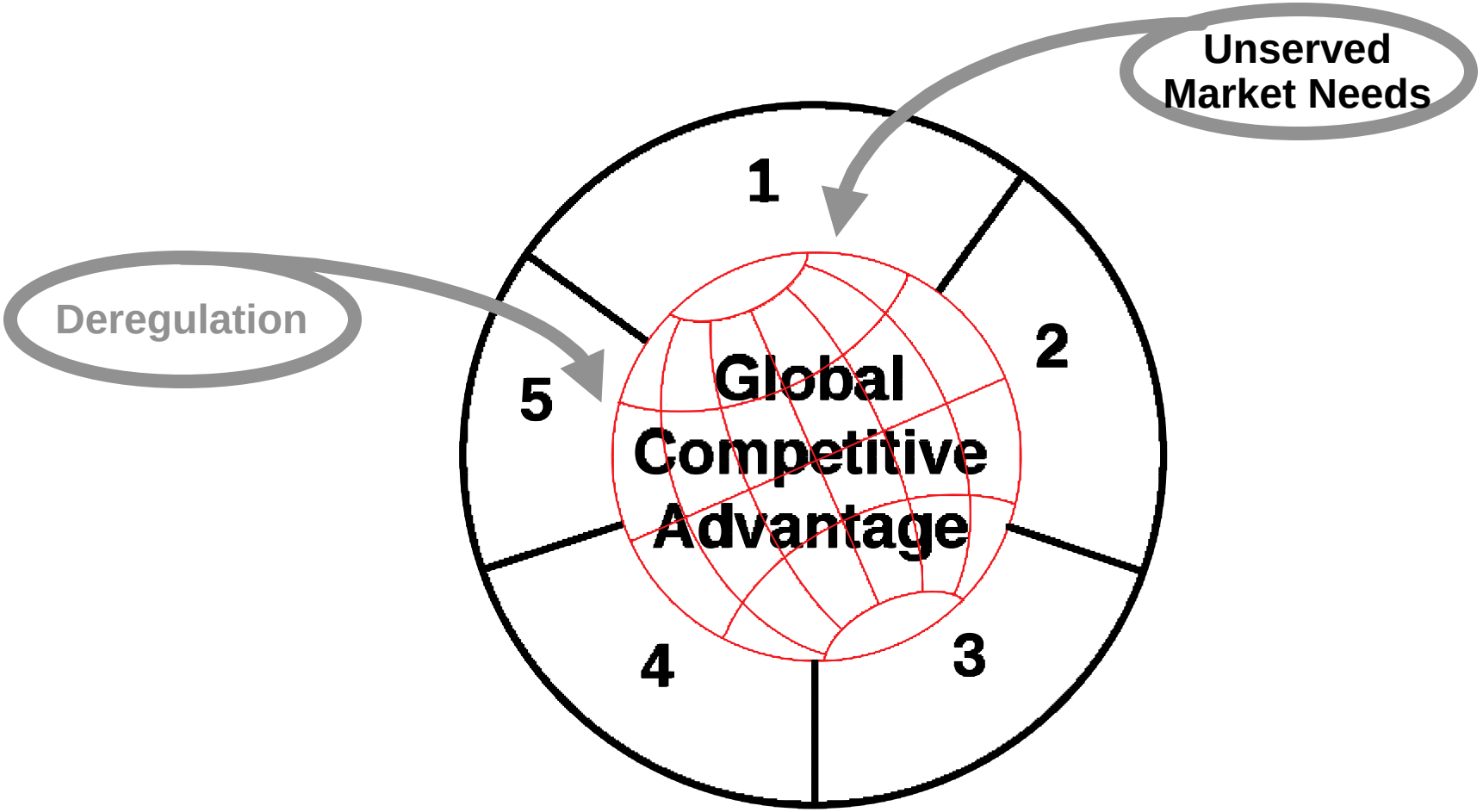

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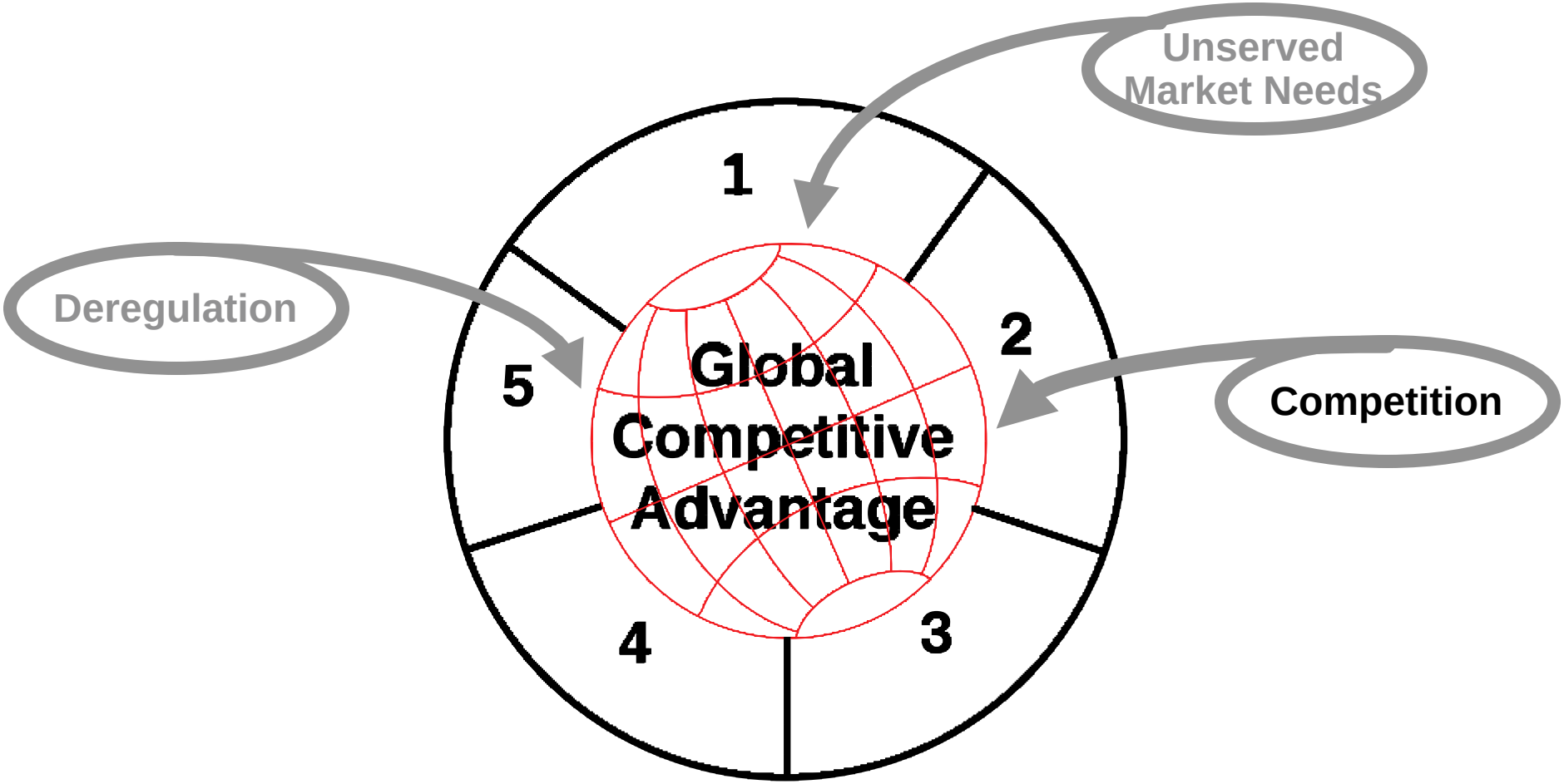

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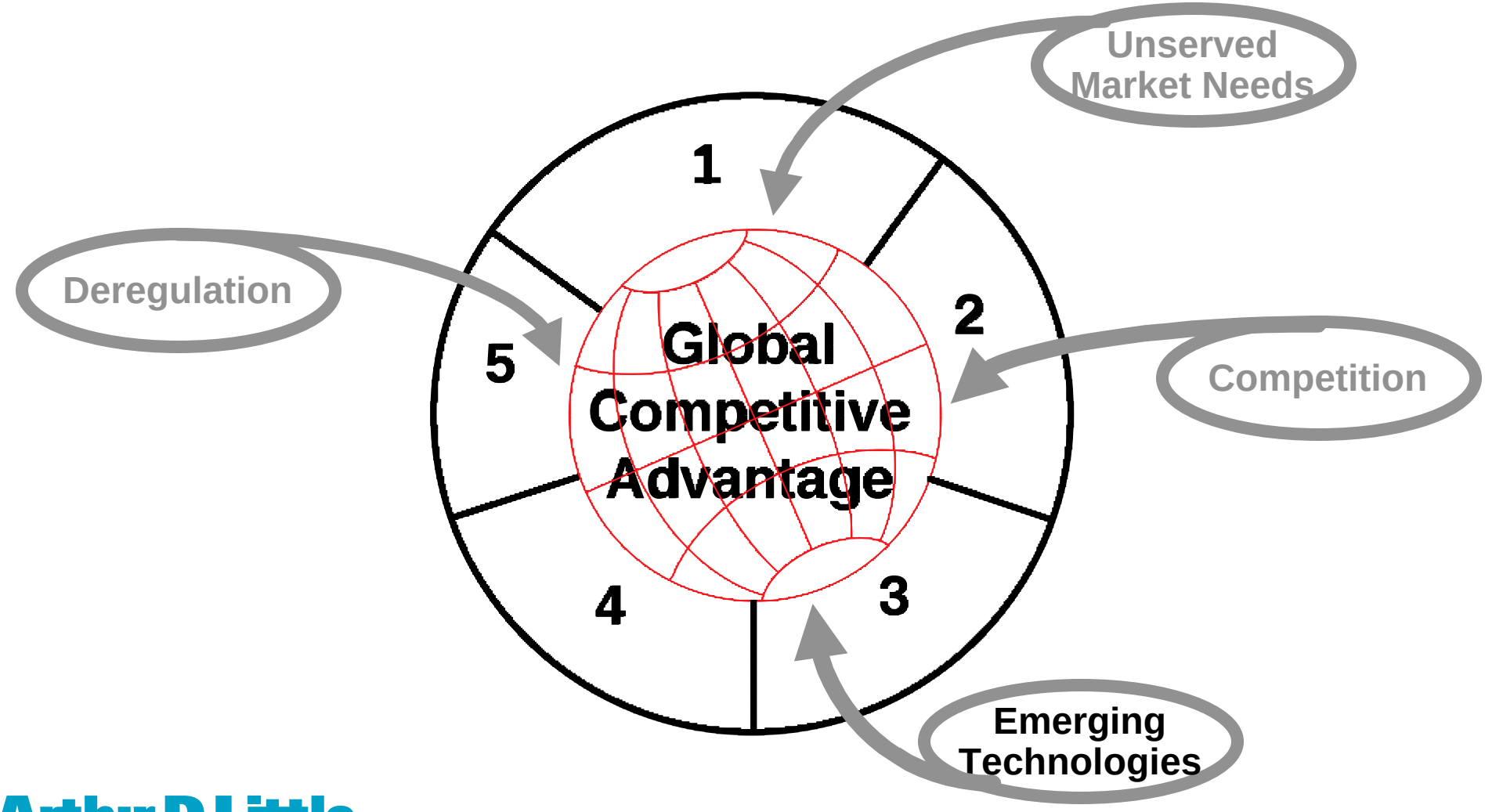

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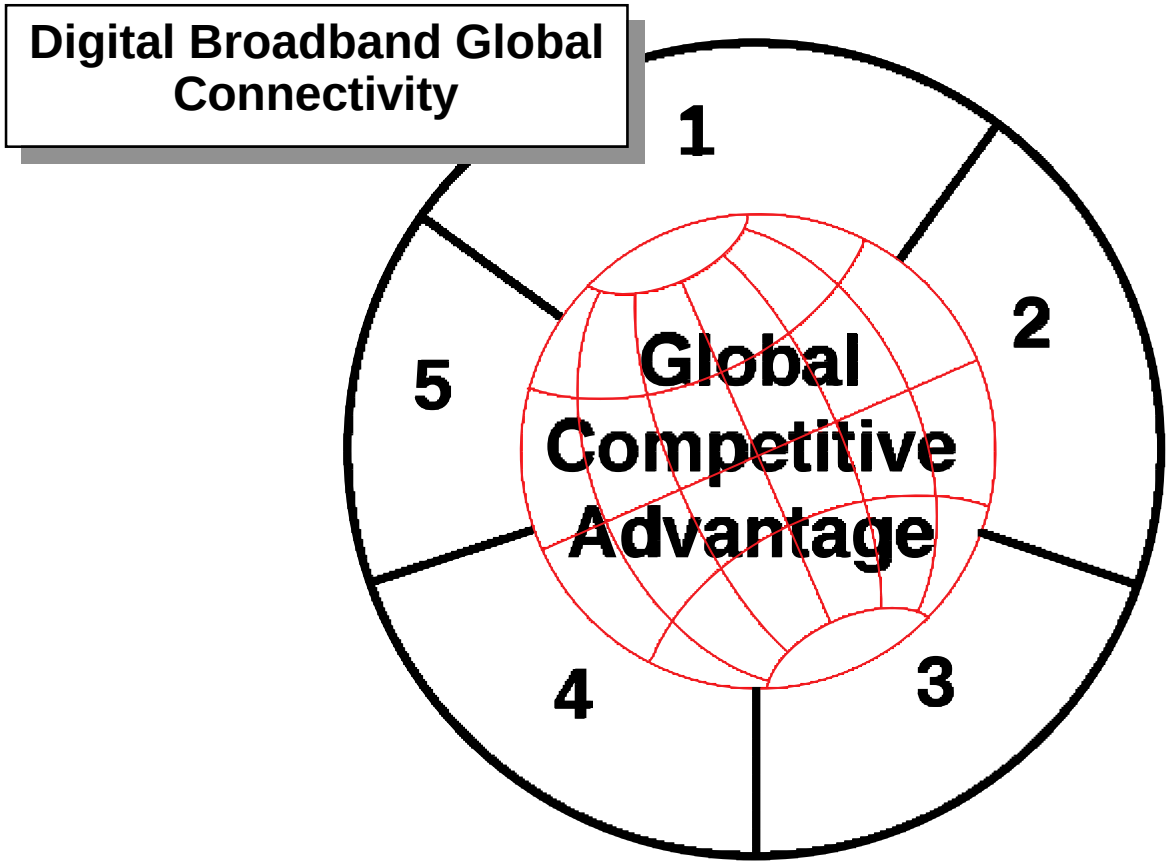

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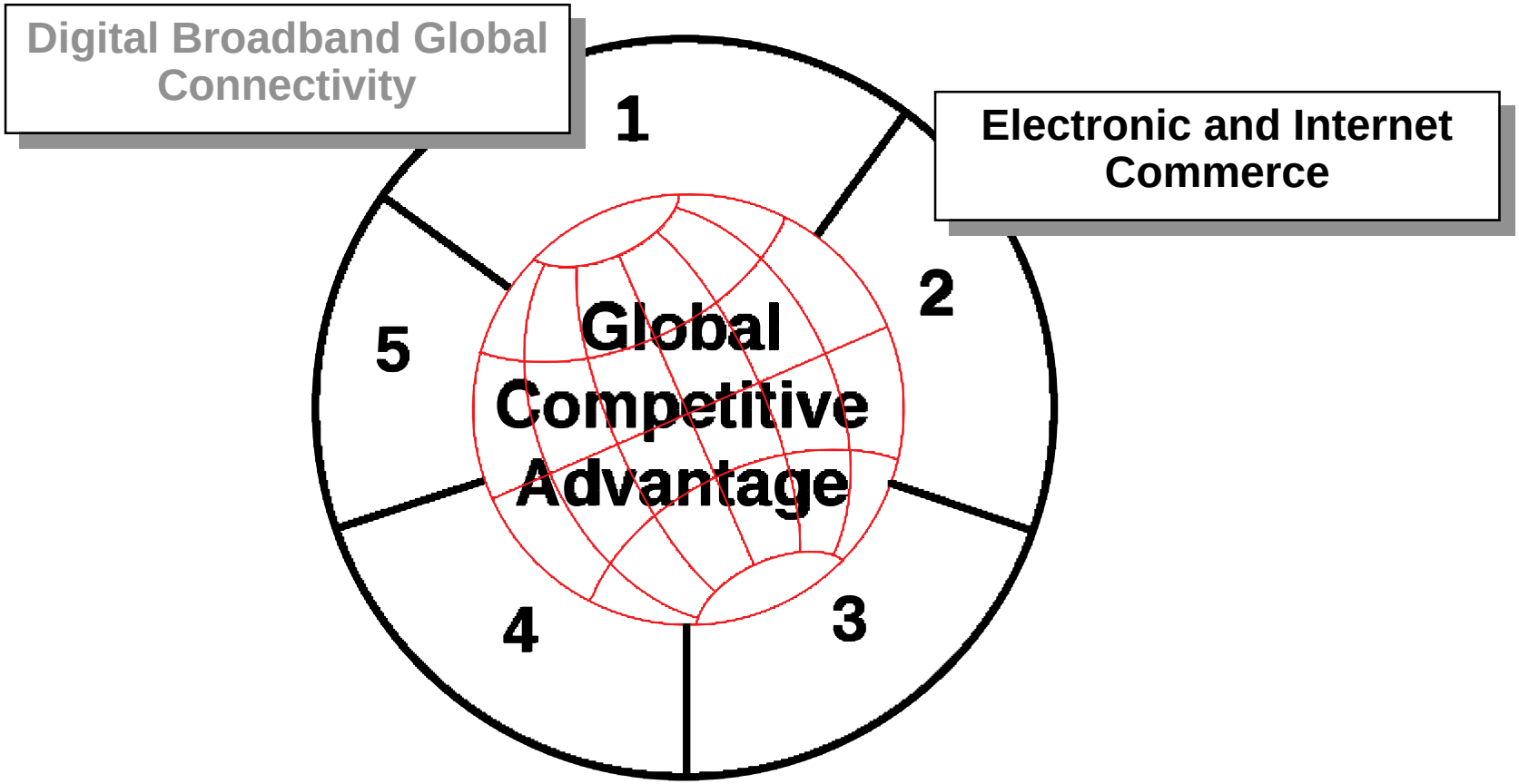

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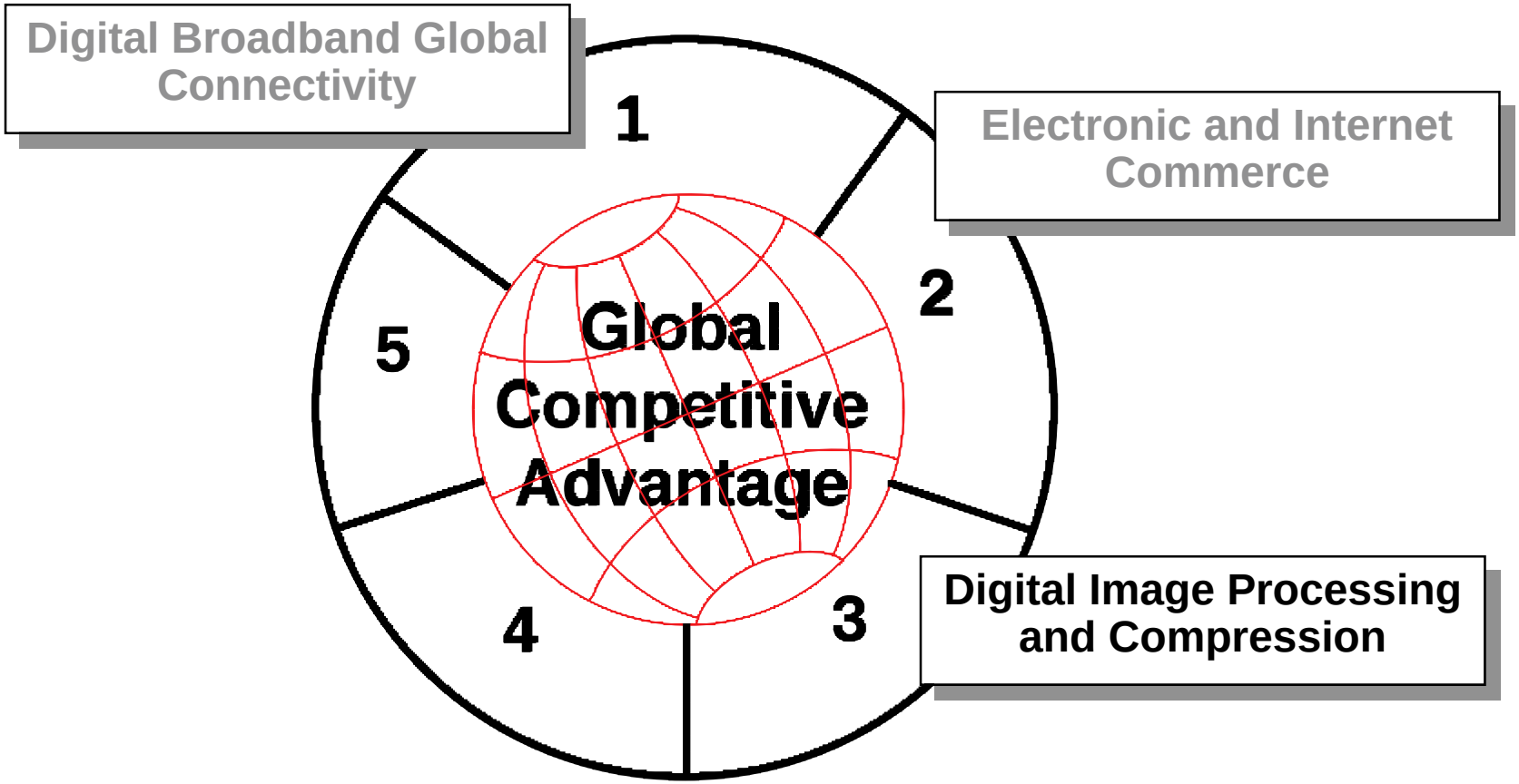

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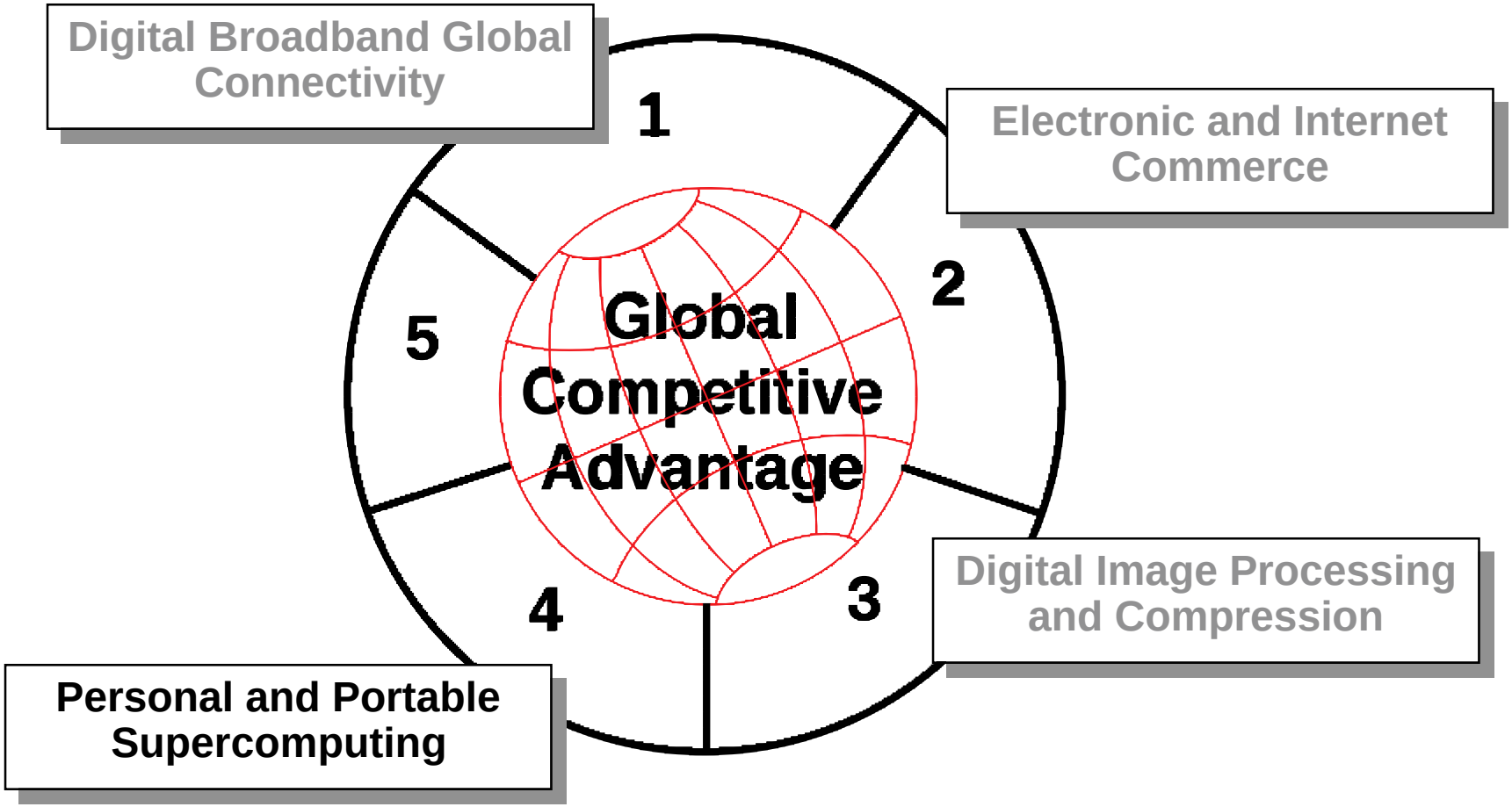

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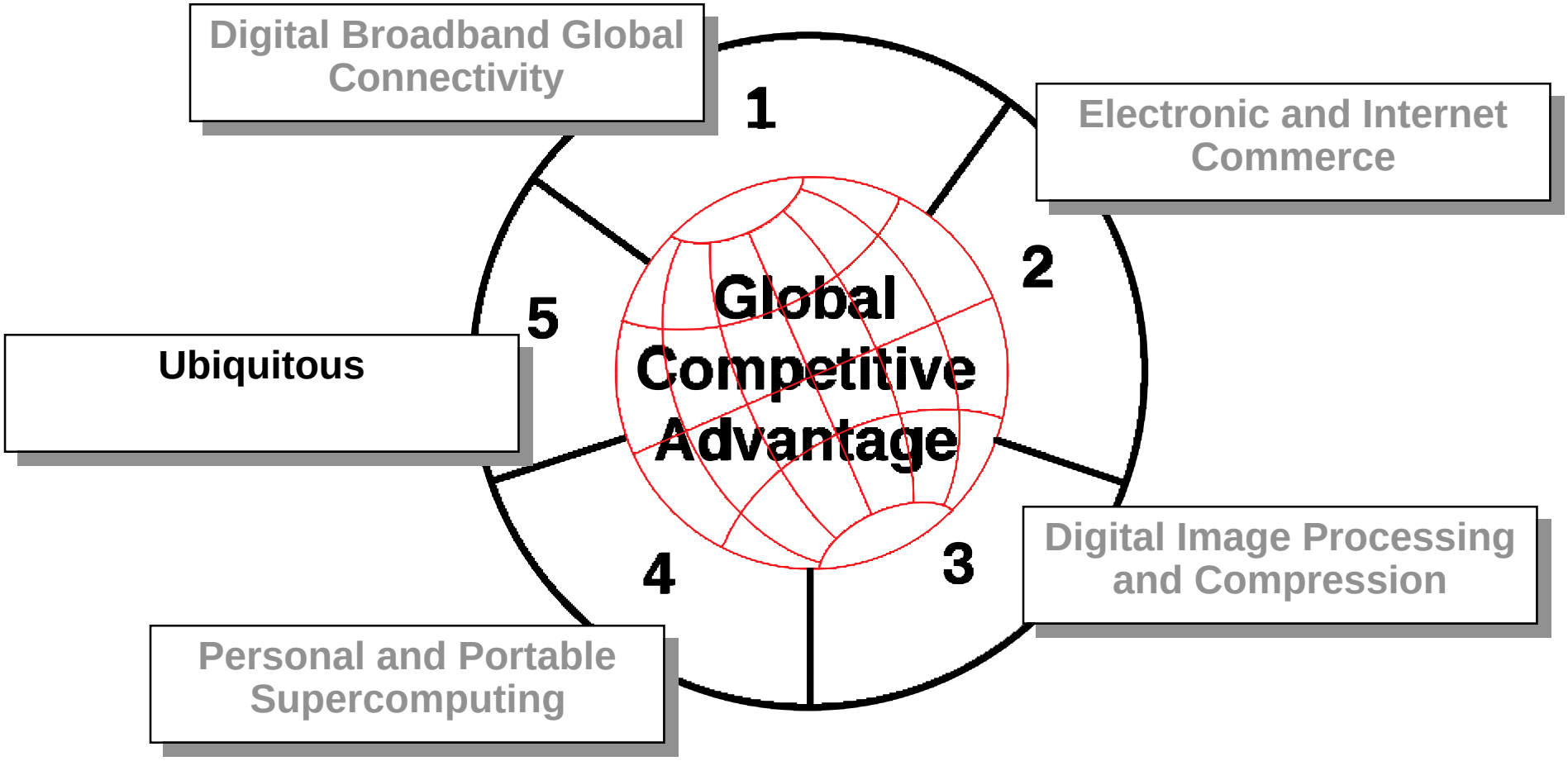

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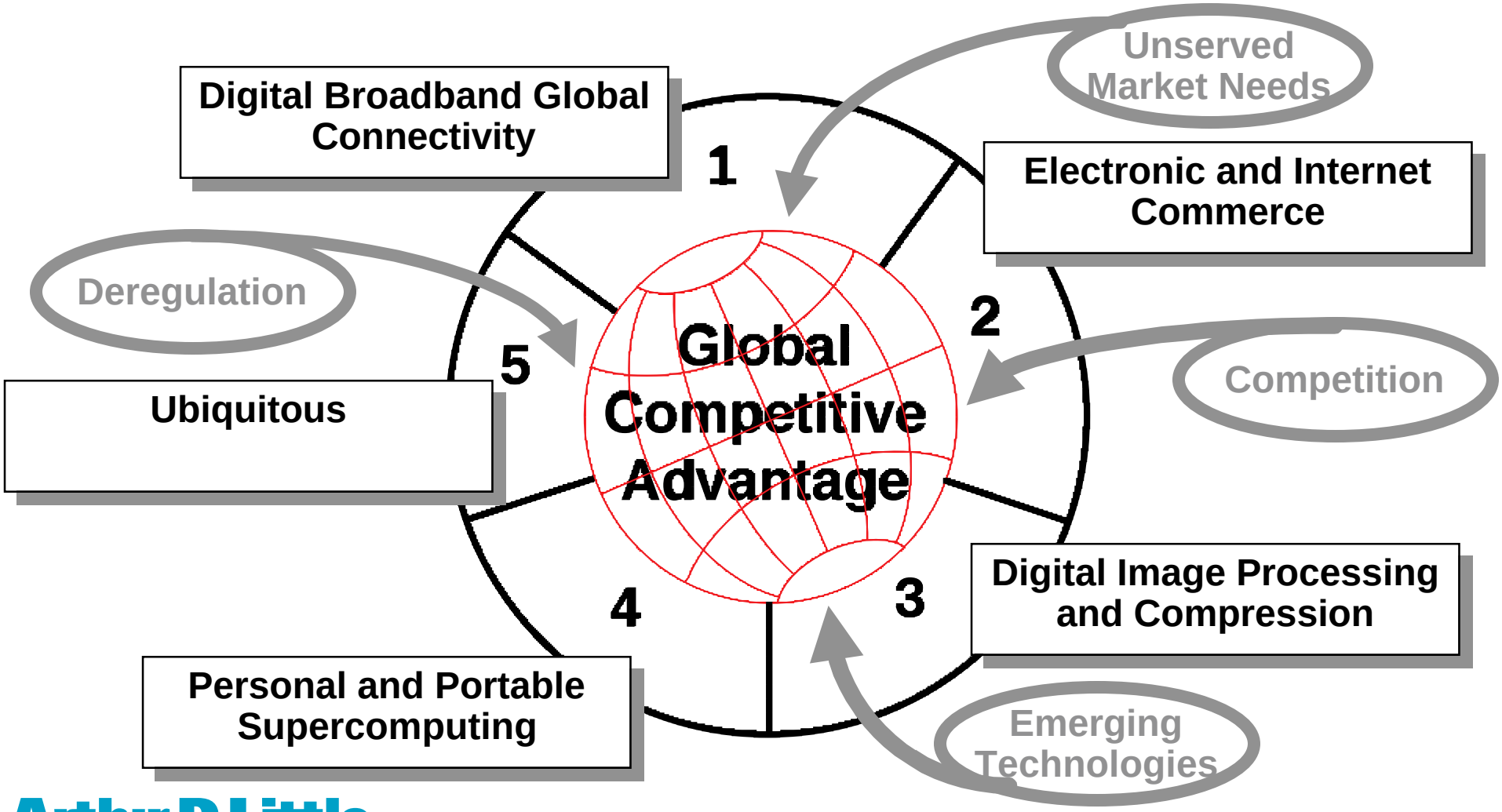
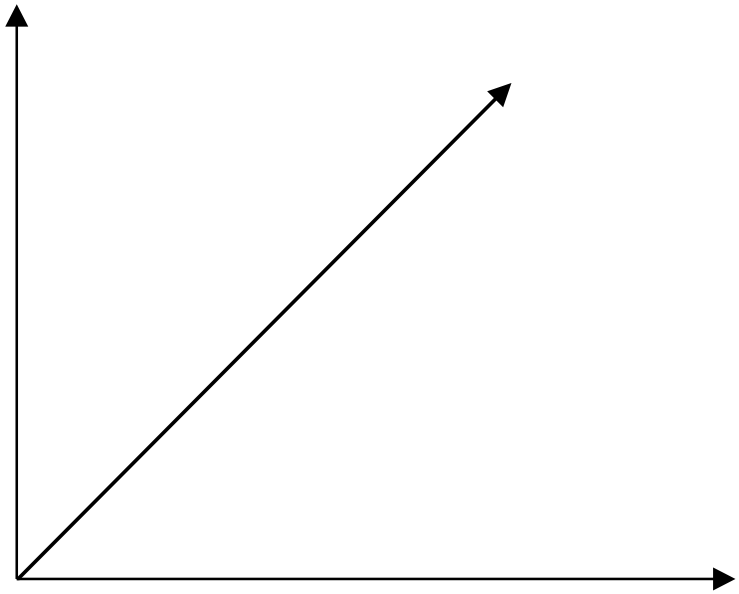


To succeed in the new era of deregulation, new market needs, and new technologies a telephone local exchange carrier will need to re-invent themselves in three dimensions- all at once!



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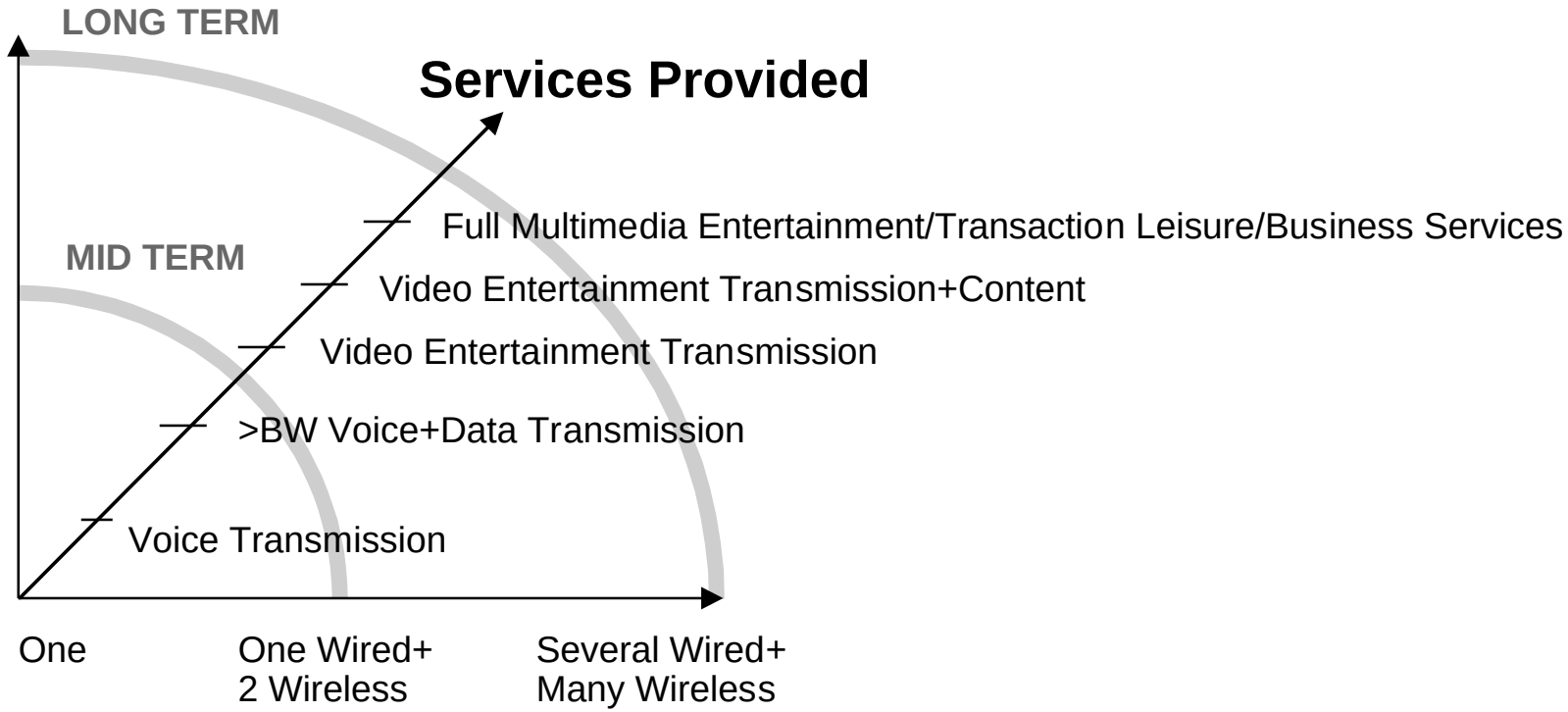

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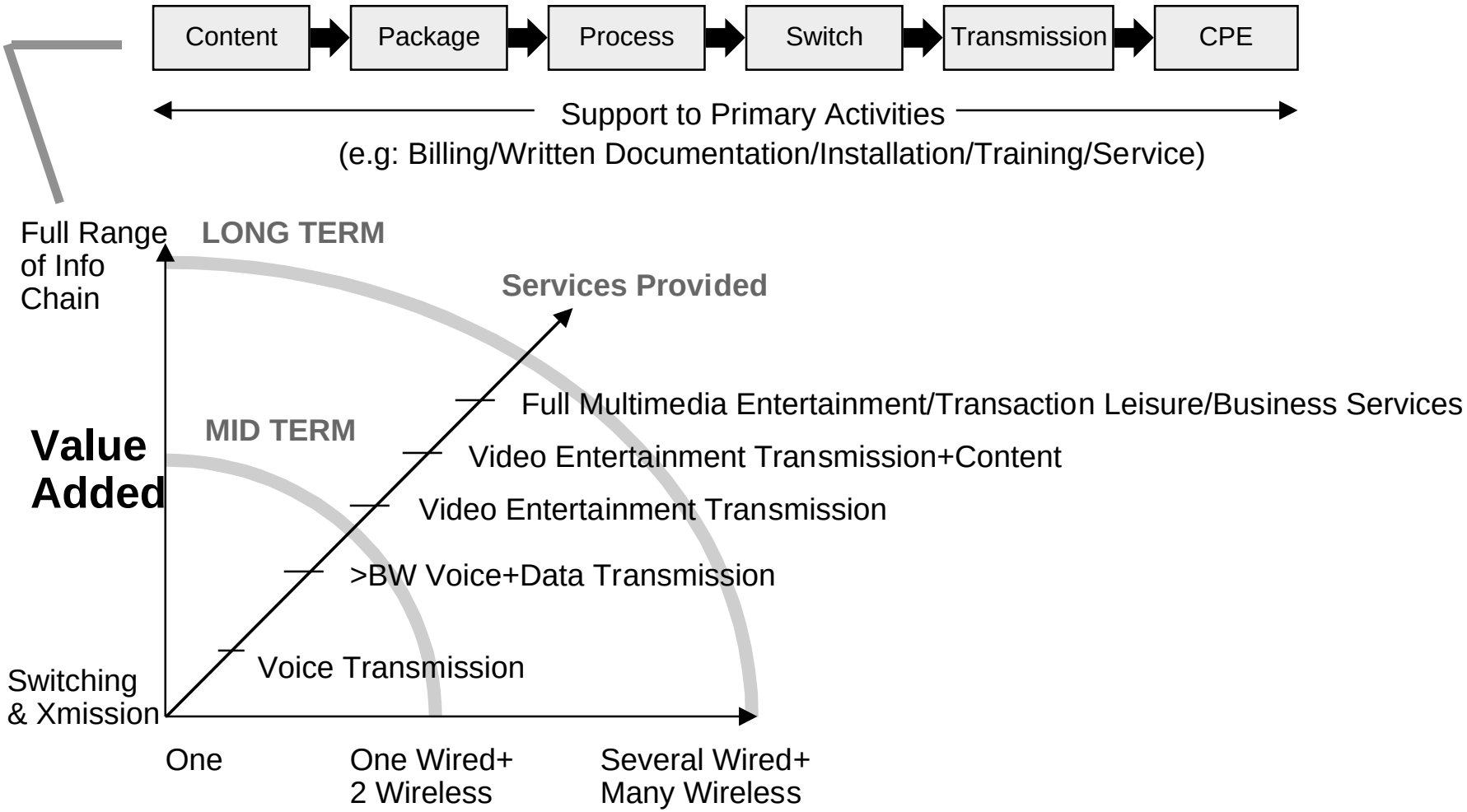
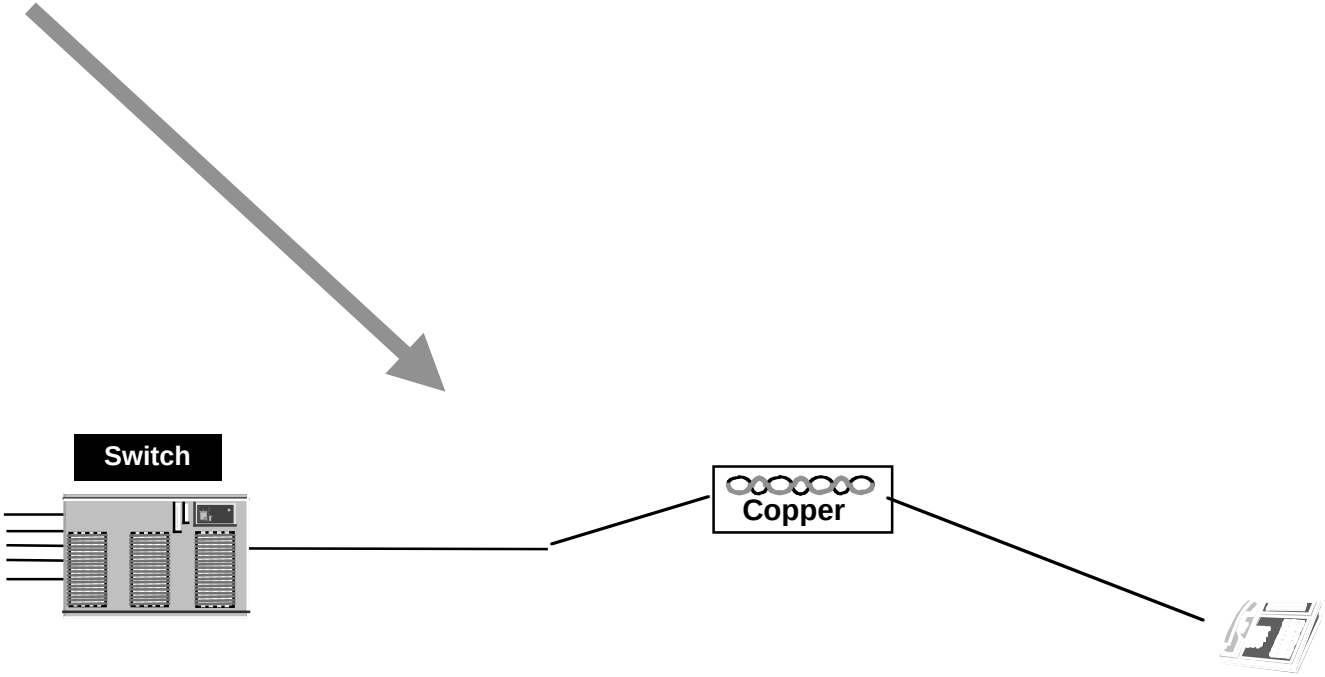


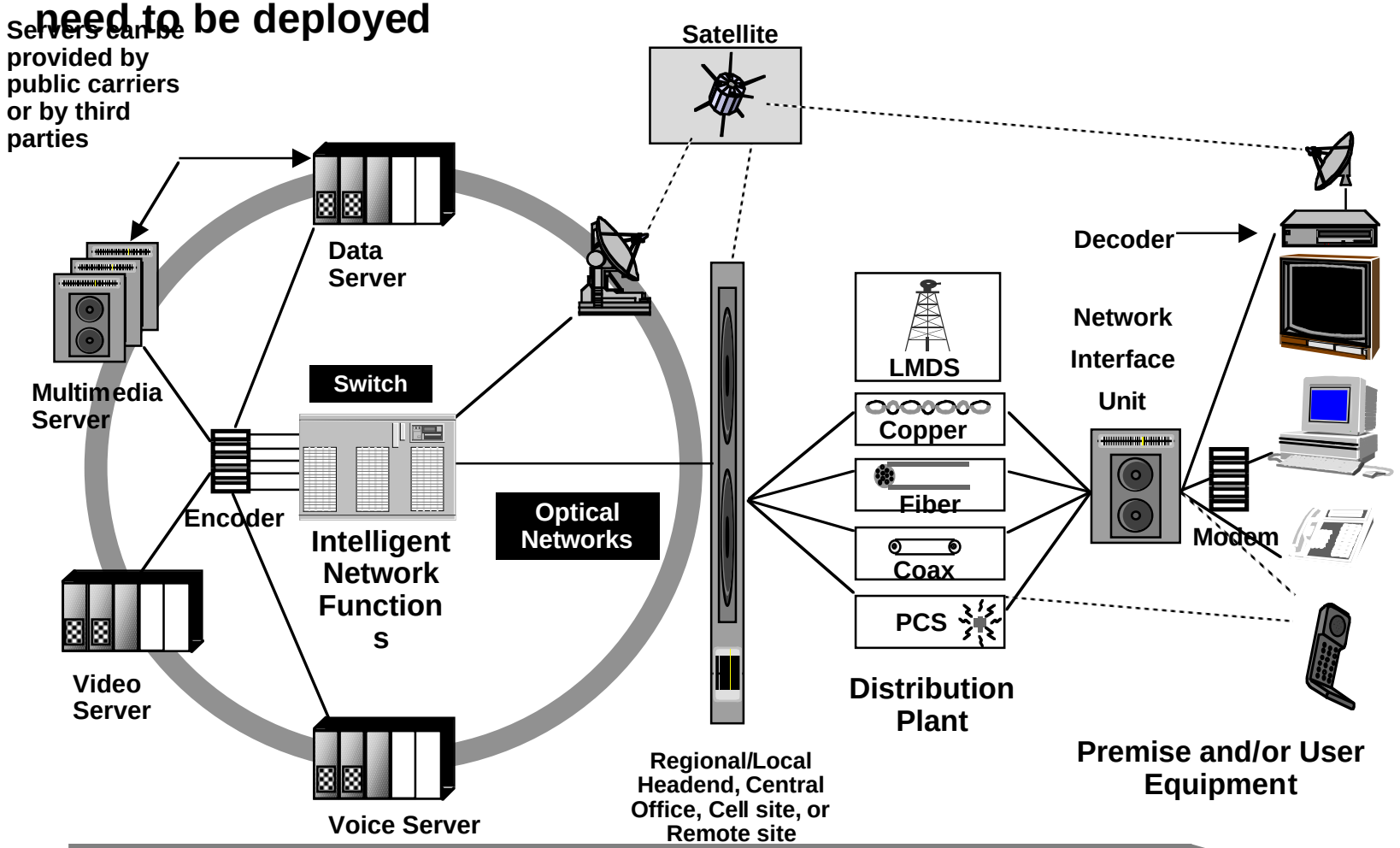
Telecom industry has moved beyond evolution - disruptive and explosive changes created new and exciting business opportunities.

Drivers	Consequences
De & Re-regulation	New competition
	New pricing models
	Rapid service creation
	Horizontal & vertical integration
	Bundling
Globalization	Multistandards
	Design for Flexibility
	Cost challenges
	Distributed manufacturing
	Distributed sourcing
New Market Needs	Multimedia Experiences
	Mobility Management
	Unified Messaging
	Convergent Customer Service
	One Stop Shop
	Choice
New Technologies	Wireless
	High Speed Data
	Advanced MMIs
	Distributed Intelligent Computing
	Image Processing
	Internet
	Fiber in the Loop

Conventional Networks will be Enhanced with Next Gen Infrastructure

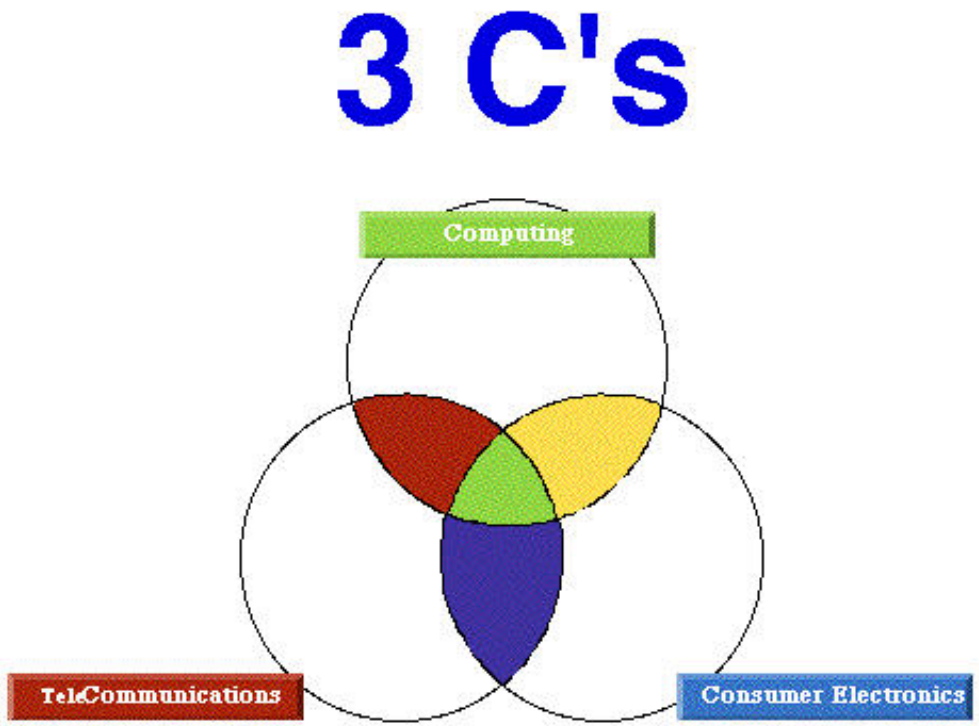


To rise to the challenge, new multimedia broadband architectures will need to be deployed

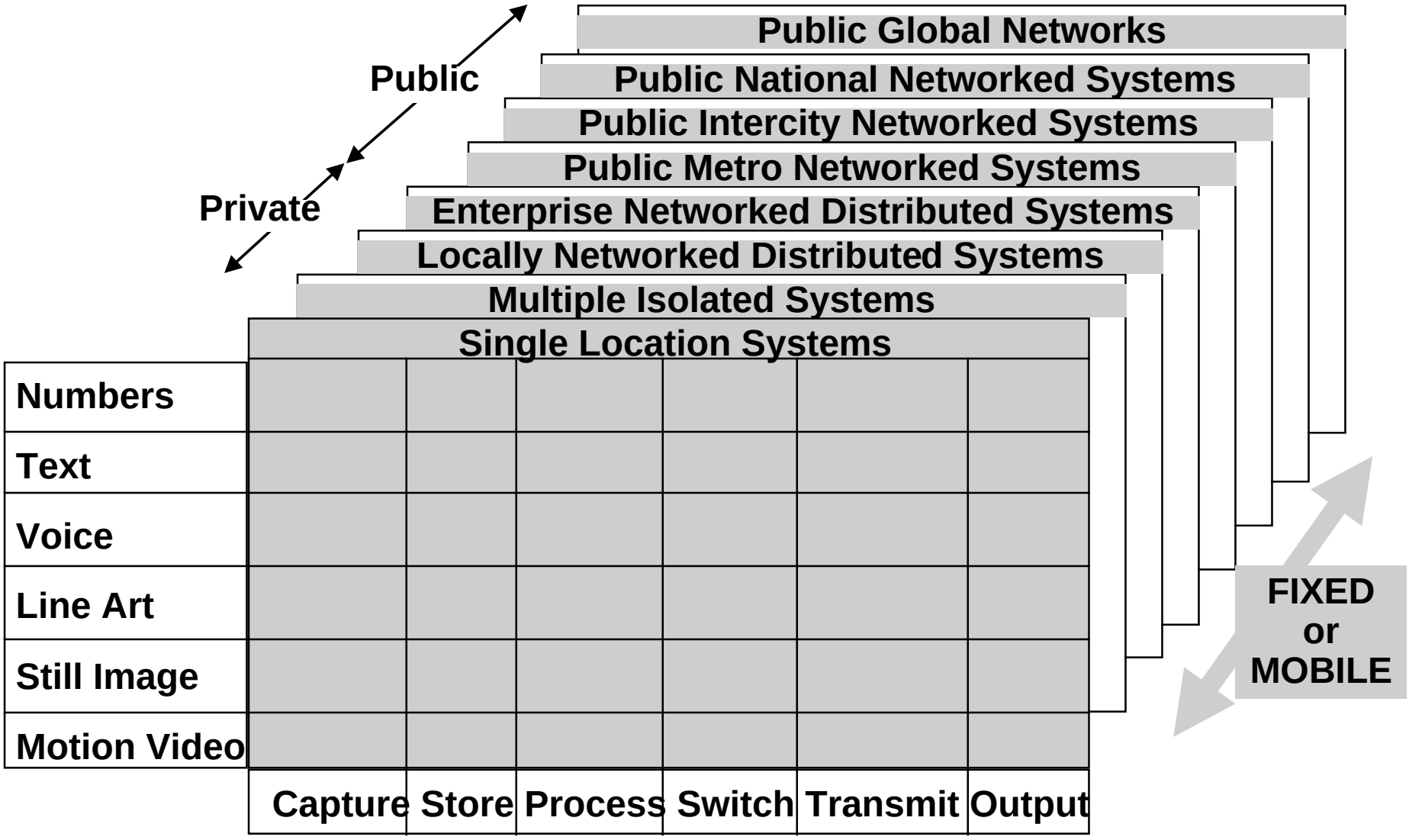


Operational Support Systems & Services (e.g. Network Management, Billing, Customer Validation, Clearing-house services)

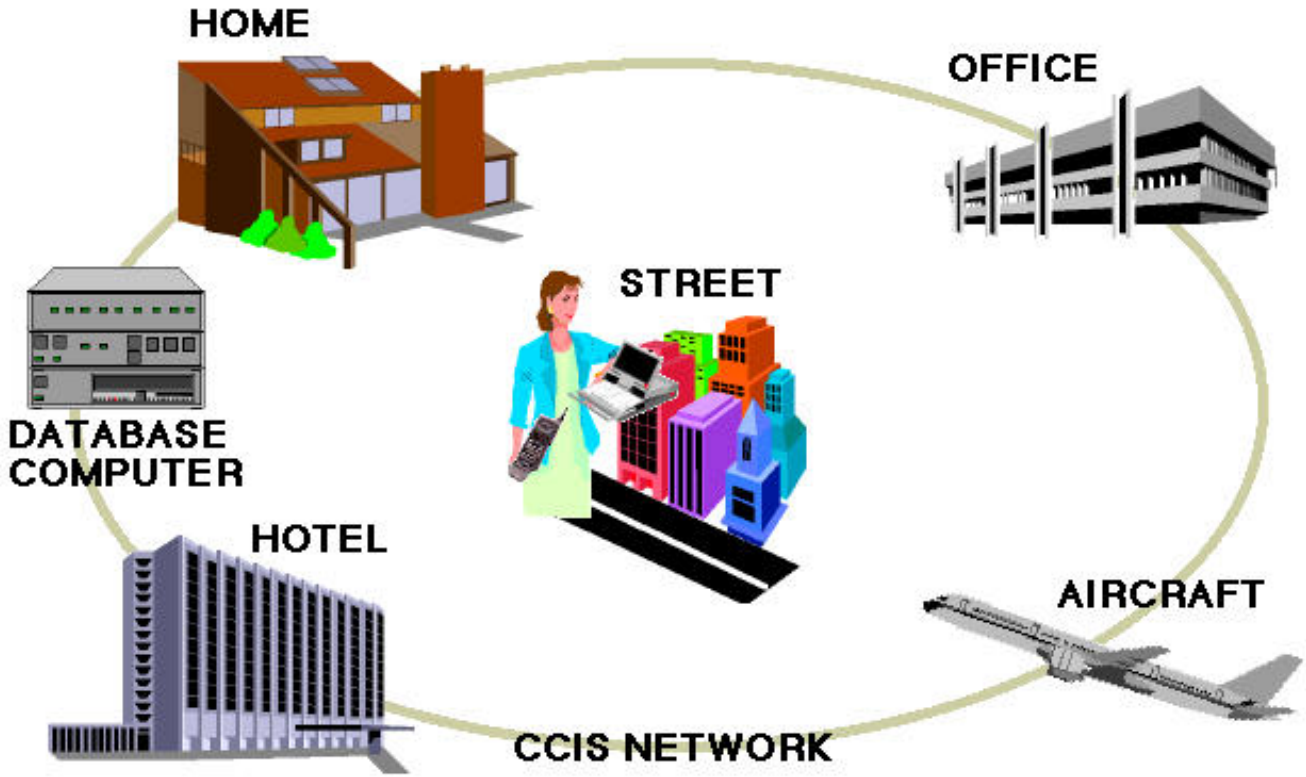
Carriers now realize that there is an important 4th C



Broadband technology and other trends are driving toward convergence and a general filling in of the entire space

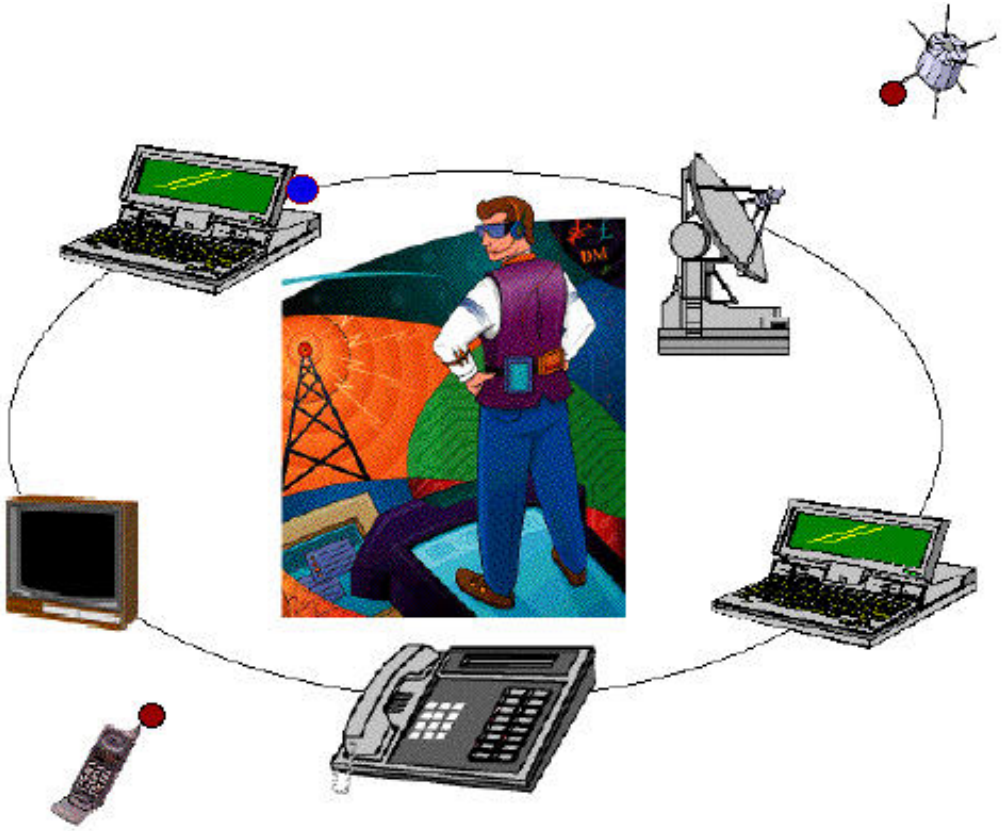


Common to many visions are ubiquity, broadband, multimedia, and embedded intelligence



Applications Visions

Common to many visions are ubiquity, broadband, multimedia, and embedded intelligence with all kinds of devices



Multimedia 3rd Generation Wireless

Virtual Reality Electronic Commerce

Network Based Virtual Reality Gaming

Agent Assisted Telecommuting/Homework

While the visions of the future are not new, only recently have we begun to supply the missing links to connnect the unserved needs to the technologies