Cost Modelling

Alan Short
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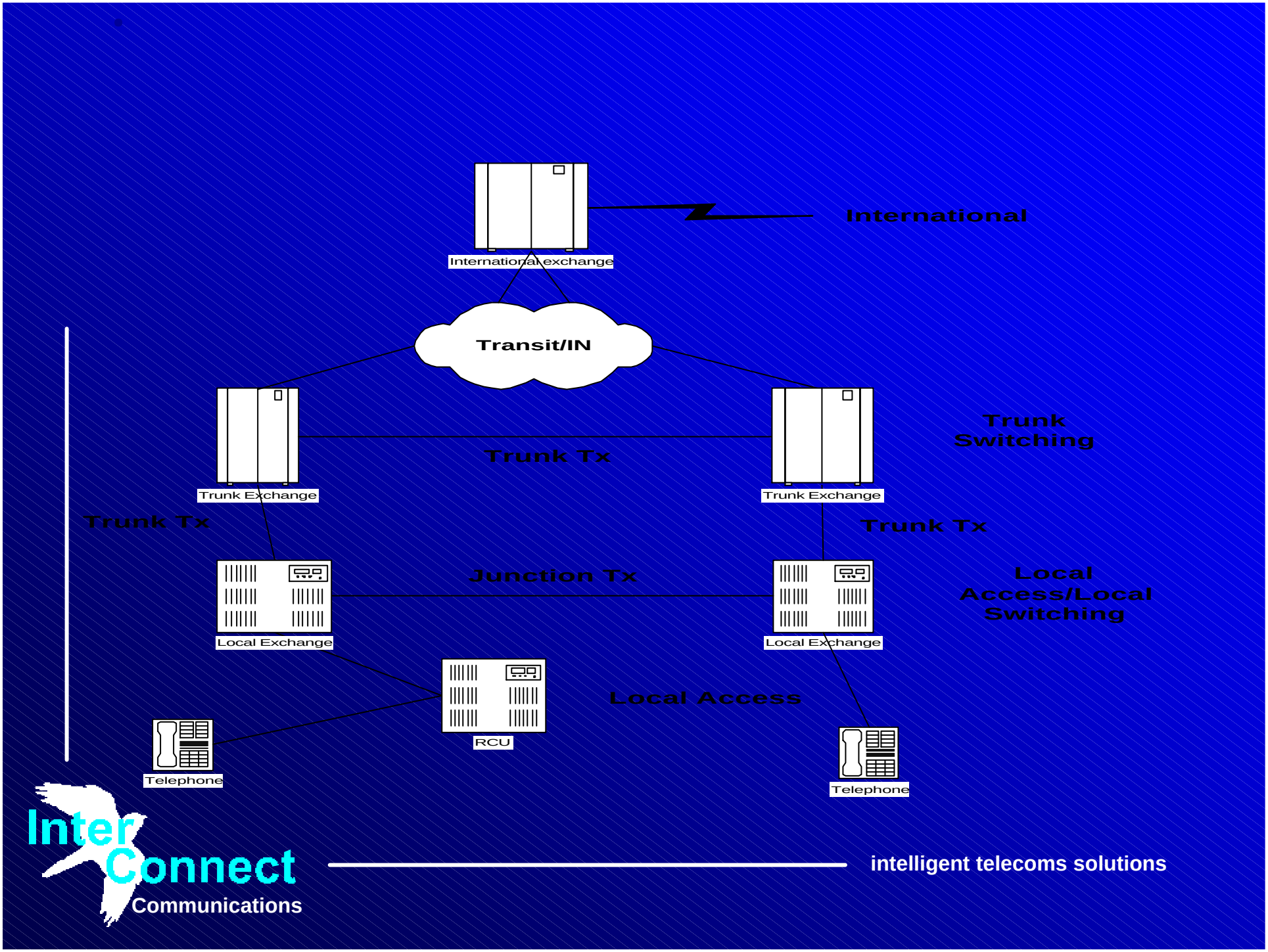
What is being costed?

- Total service
  - service provision and access
  - calls
  - interconnect
  - value added services
  - leased lines
  - data services


International exchange
International
Transit/IN
Trunk Exchange
Trunk Exchange
Trunk Tx
Trunk Switching
Trunk Tx
Trunk Tx
Junction Tx
Local Exchange
Local Exchange
Local Access/Local Switching
RCU
Local Access
Telephone
Telephone
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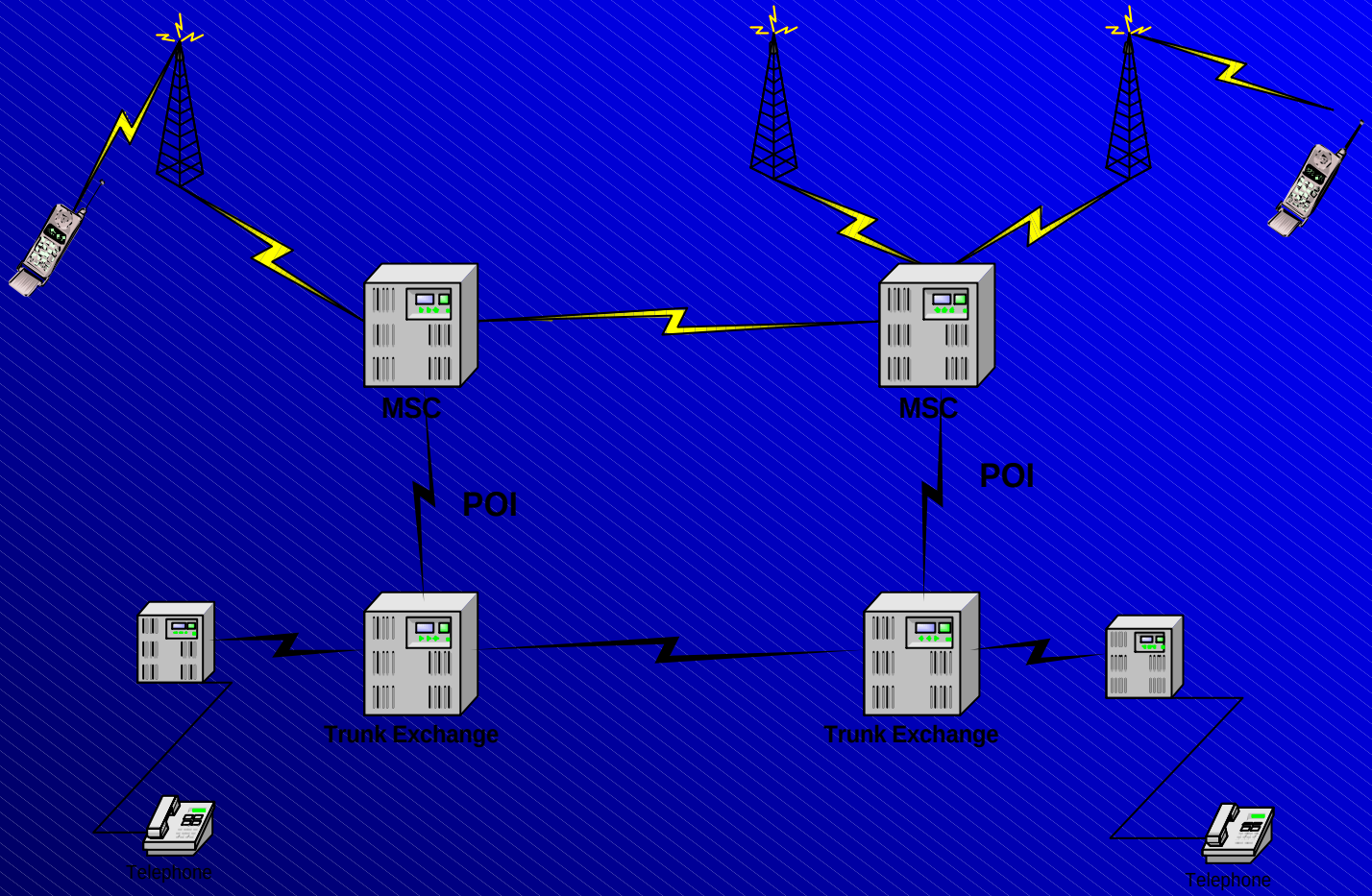

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Elements of Cost

Local Access

Switching

Transmission

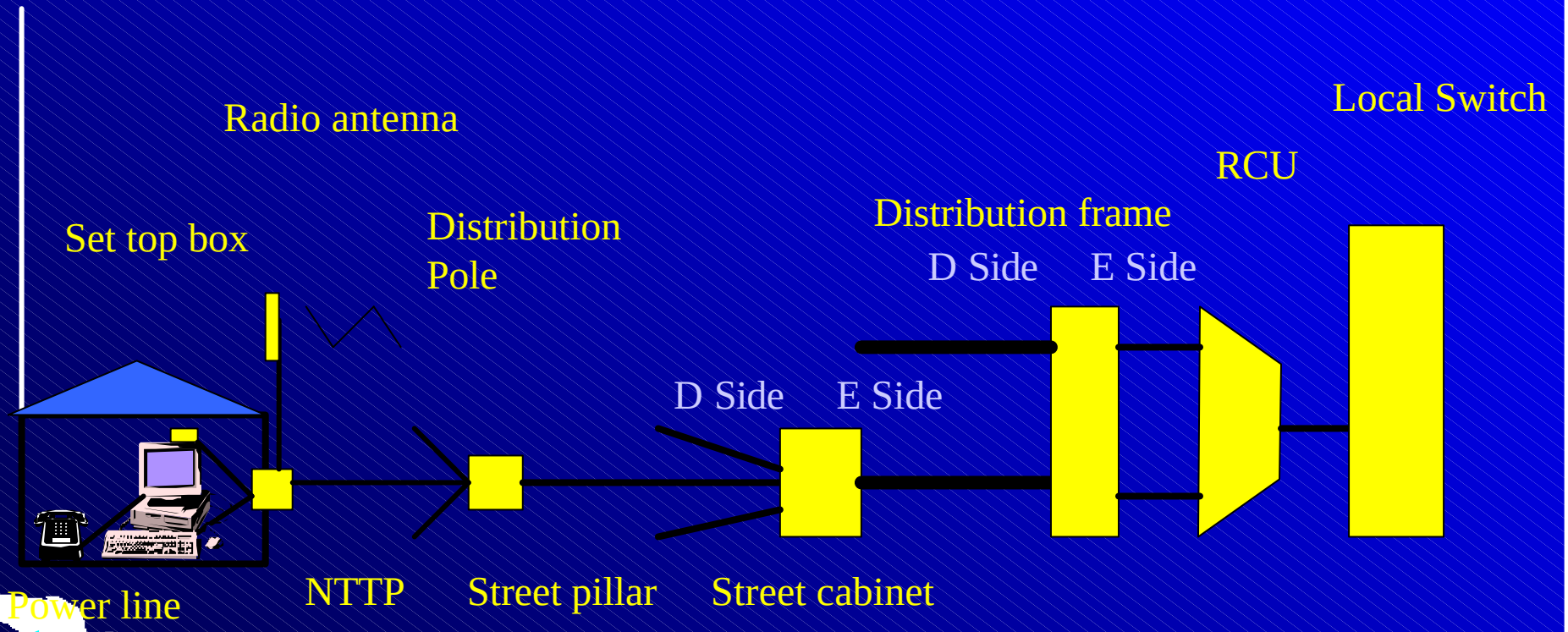
Retail

Overheads

Local Access

- Drop wire, Cables, DPs
- Ducts
- RLL
- RCU
- RCU to host exchange transmission
- Local exchange elements

Local Loop Elements



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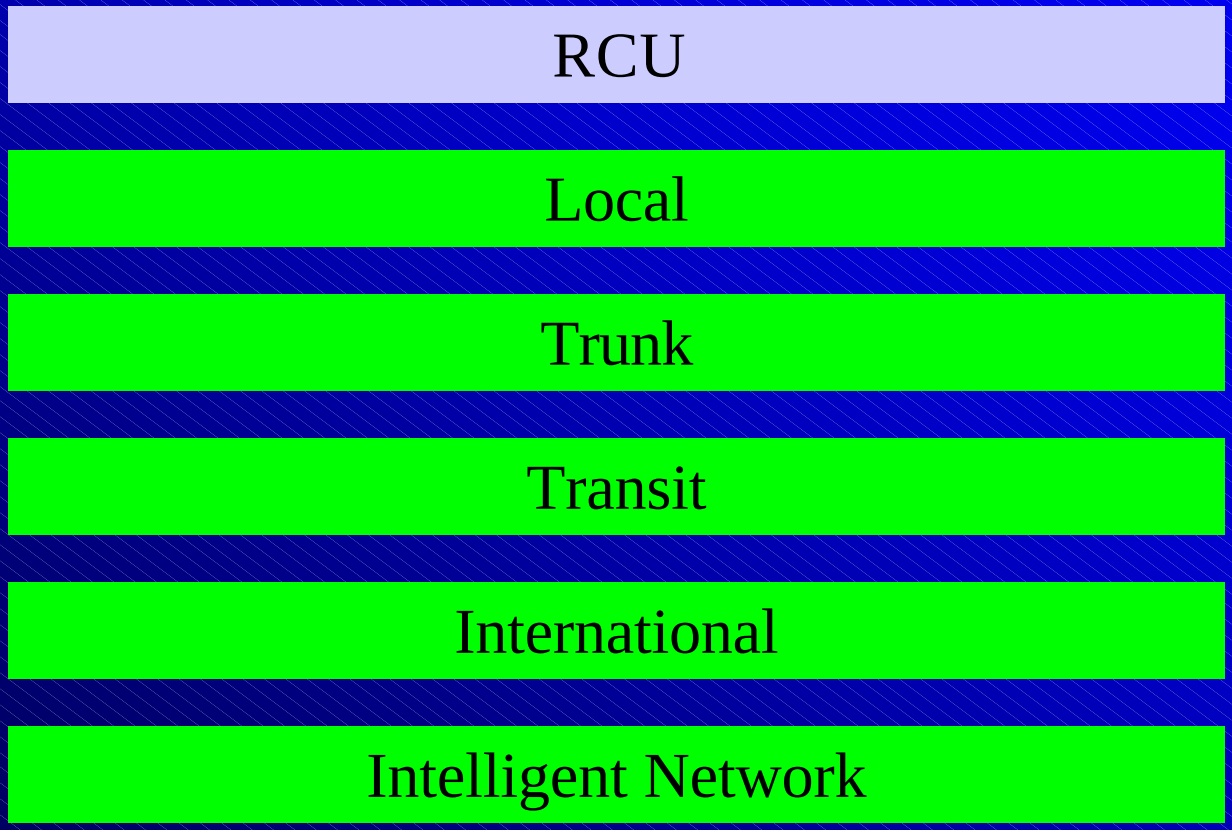
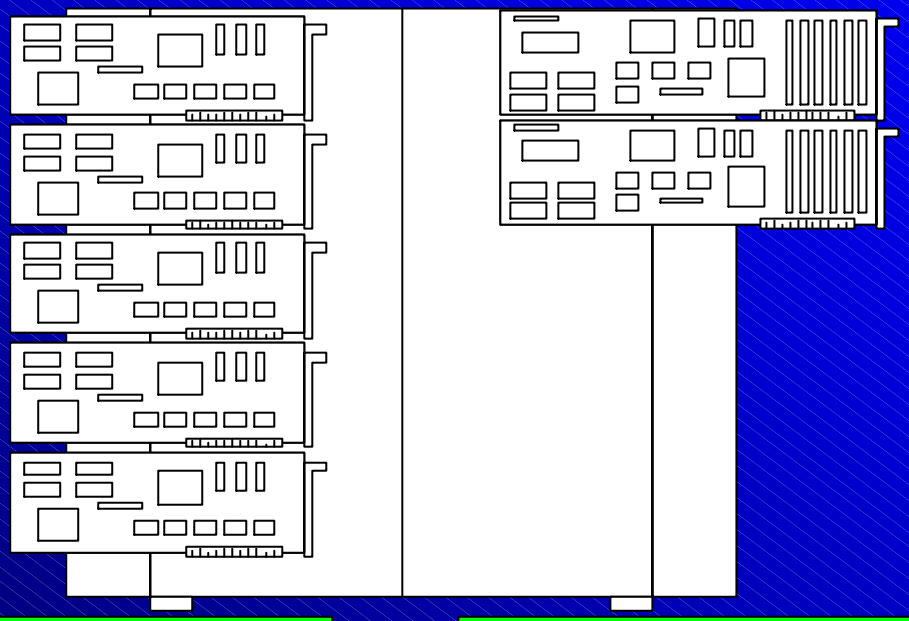
Local Access Costing Issues

- FAC v LRIC
  - Current cost accounting
  - RCU policy
- Connection v Traffic dependent
- Sharing of network components
  - leased lines
  - core network

Switching


RCU
Local
Trunk
Transit
International
Intelligent Network

Local Switch



Line Cards

Trunks

Signalling

Common Control

Switching Matrix

Connection Dependent

Traffic Dependent

Power and Air Conditioning

Accommodation

Software

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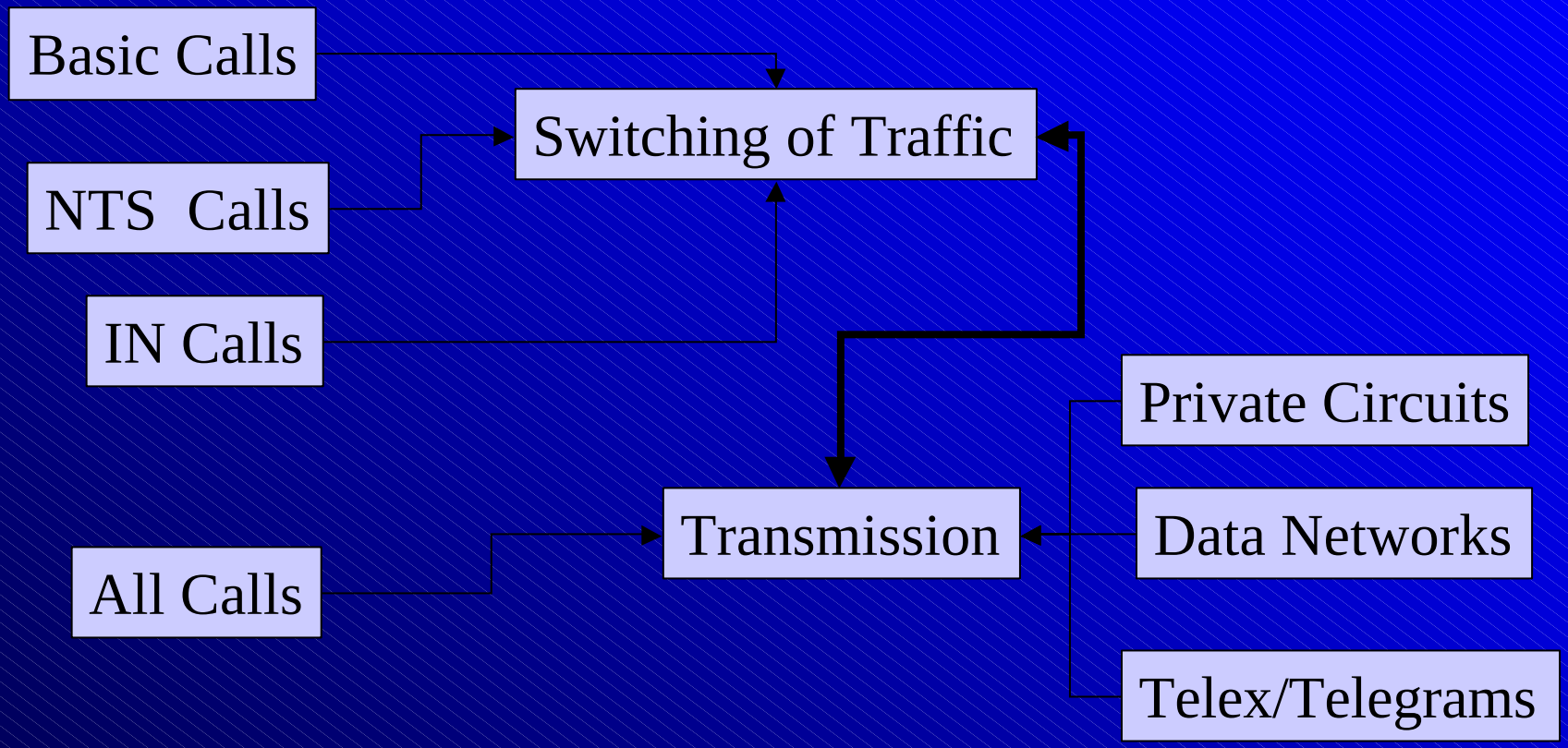
Switching Cost Issues (1)

- Traffic dependent elements
- Connection dependent elements
- Call set up cost (all call attempts)
  - Signalling
  - Element of common control
  - Element of switching matrix
  - Power and air conditioning

Switching Cost Issues (2)

- Traffic cost (successful calls)
  - Switching matrix
  - Common control
  - Billing
  - Power and air conditioning
- Transit/Trunk network
- Cost pools

Trunk Network



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Transmission

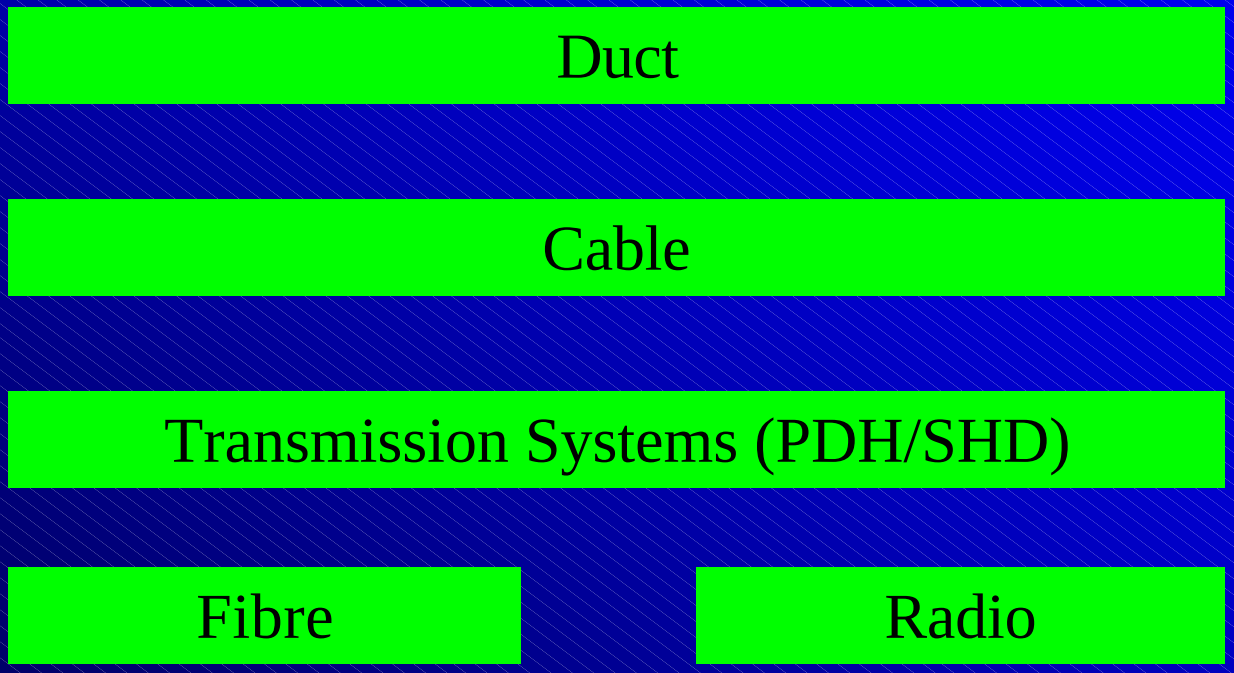
Inter-Local exchange (Junction)

Trunk

Transit

International

Transmission Technologies



Transmission Costing Issues (1)

- Service dependent
  - Leased lines
  - Data services
  - Telex/Telegraph
- Local access/Trunk network sharing
- Value of assets (CCA v LRIC)

Transmission Costing Issues (2)

- Fixed and distance related elements
- PDH and SDH technology
- Spare capacity
- Wayleaves
- Cost pools

LRIC Service Relationship

- Where possible the network should be broken down into elements related to a single service
- Where an element must be shared between services the costs must also be shared

LRIC Method (1)

- Calculate network components for desired combinations of service demands
- Project operating costs from deployed network components

LRIC Method (2)

- Build element costs from component costs and operating costs for given traffic and line demands
- Derive network costs for desired combinations of service demands
- Allocate derived costs to services

InterConnect Management System (IMS)
Cost Allocation Model for Telecommunications Operators

Session C

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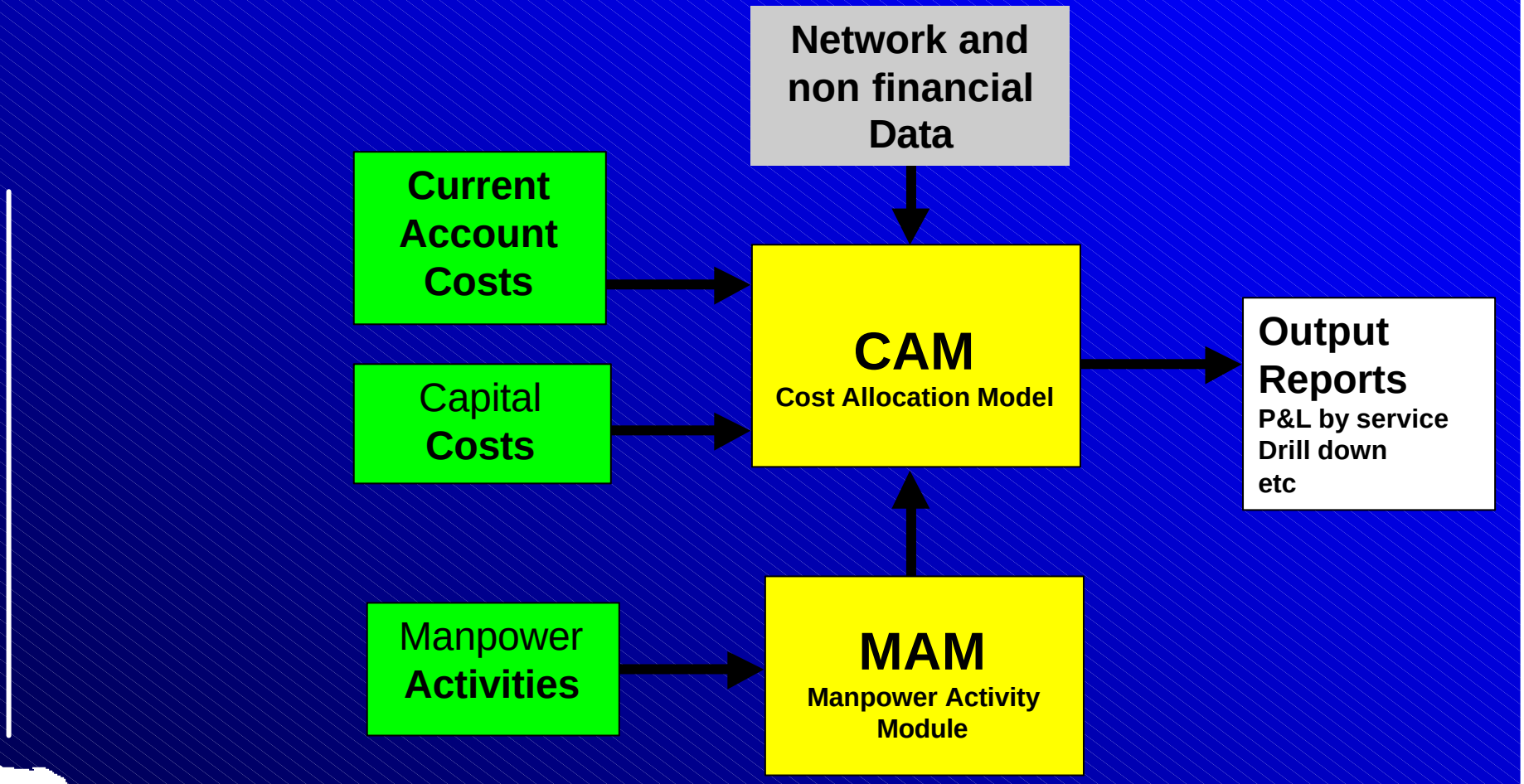
CAM Objective

- Enables Telecommunications Operators to understand:
  - the costs of providing individual services over a common platform;
  - the cost elements of each individual services;
  - the profitability of individual services.

CAM Decision Support System



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Business Benefits

- CAM assists network operators take informed decisions concerning such aspects as:
  - setting tariffs;
  - introduction of new services;
  - cost control;
  - build or buy investment in new infrastructure;
  - the number and location of points of interconnection.

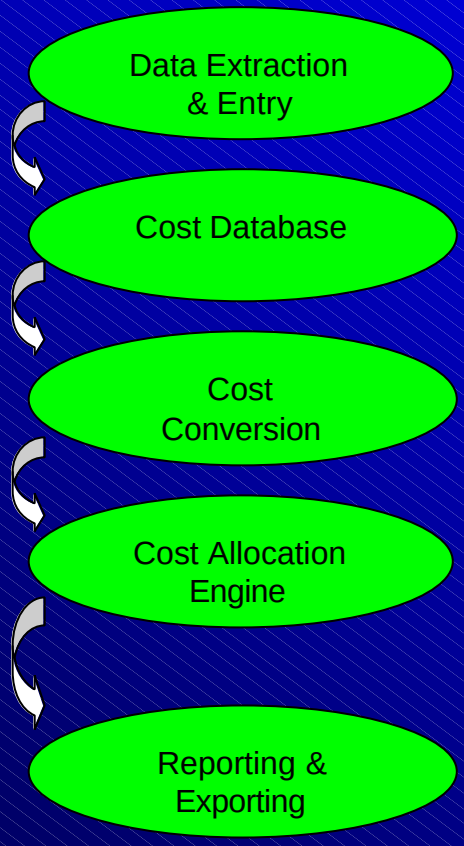
Manpower Activity Model

- Manpower is one of the largest costs within any operator.
- The Manpower Activity Model (MAM) assists the collection and allocation of costs to specific activities down to an individual employee, for input into CAM.

CAM Characteristics

- A common methodology across services
- Service selection under user control
- Trackback - see where the costs come from
- Common software platform with other IMS modules
- Incorporates Activity Based Costing (ABC) methodology

CAM Structure and Methodology



Links to user's IT Systems.
Manual or automated data entry.

Holds costs in datasets to enable simulation and variance analysis.

Spreads costs across business functions. Aggregates to cost pools.

Apportions all costs and allocates to services using a cost categorisation and pooling approach via external drivers.

- Costs by service.
- Unit cost by service.
- Service profit & loss statements.
- Interconnect element costing.
- Trackback facility.

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The Basic Algorithm

- Capture input costs and categorise to internal standards
- Spread these costs across business function/activity codes
- Aggregate the resulting cost pools across major account type groupings (employee, materials, finance, outpayments, depreciation, other costs)
- Allocate the resulting cost pools contents to destination service pools (rule-based)
- Transfer all costs at each stage

The Model Objects

- Drivers (the basis for allocation)
- Paths (the routing : costs->pools->final services)
- Order table (addressing the pools)
- Allocation matrix (the product of paths*drivers)
- Sequence matrix (the resulting model logic)

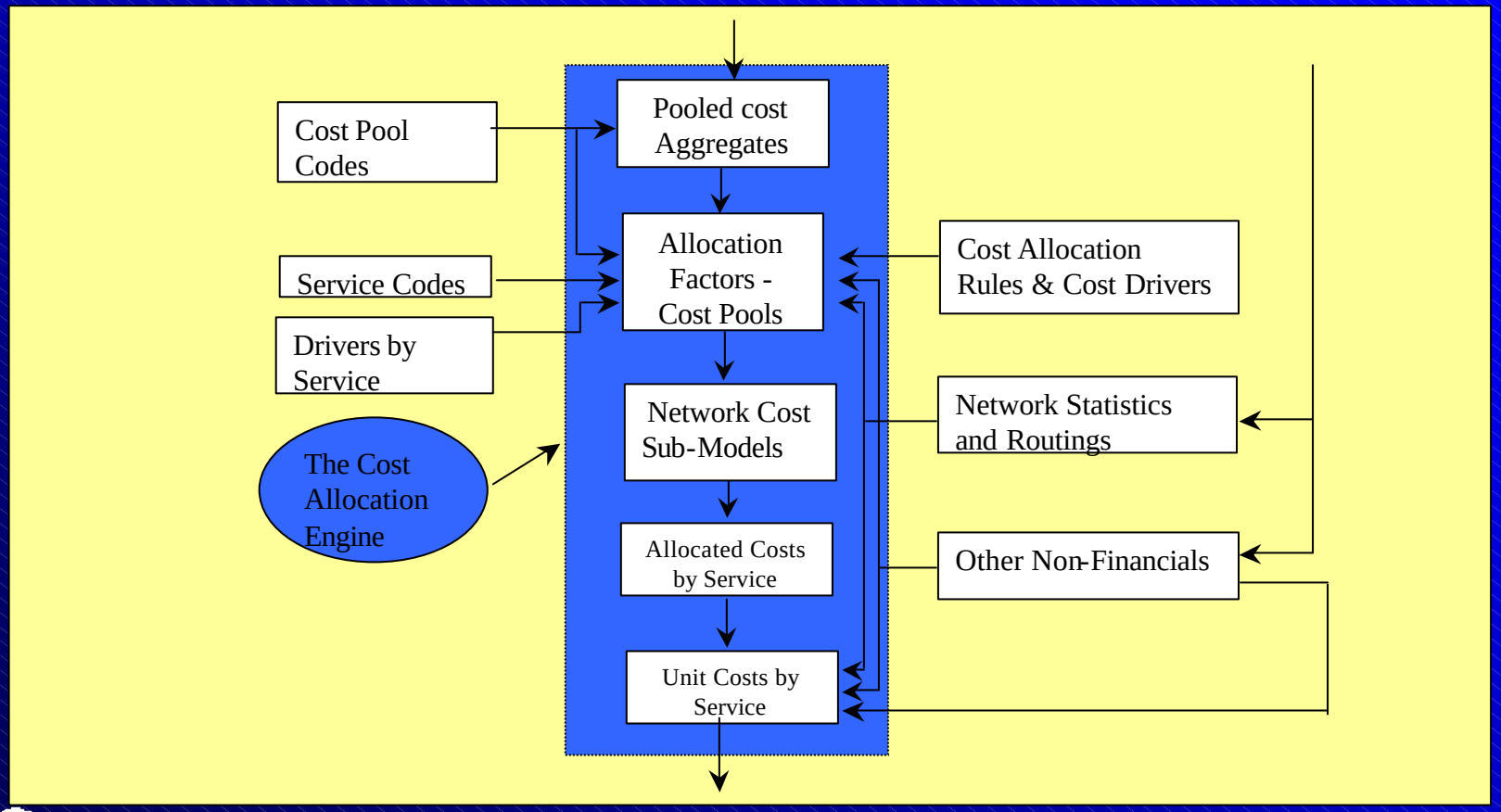
The Allocation Procedure

- User enters account-level data and drivers
- User inspects driver values and allocation matrix
- CAM runs pre-allocation table and tests for required drivers
- Missing drivers are flagged to user who must provide them
- User runs allocation loops - model reports progress
- At completion user inspects exception report, allocation audit trail and trackback report

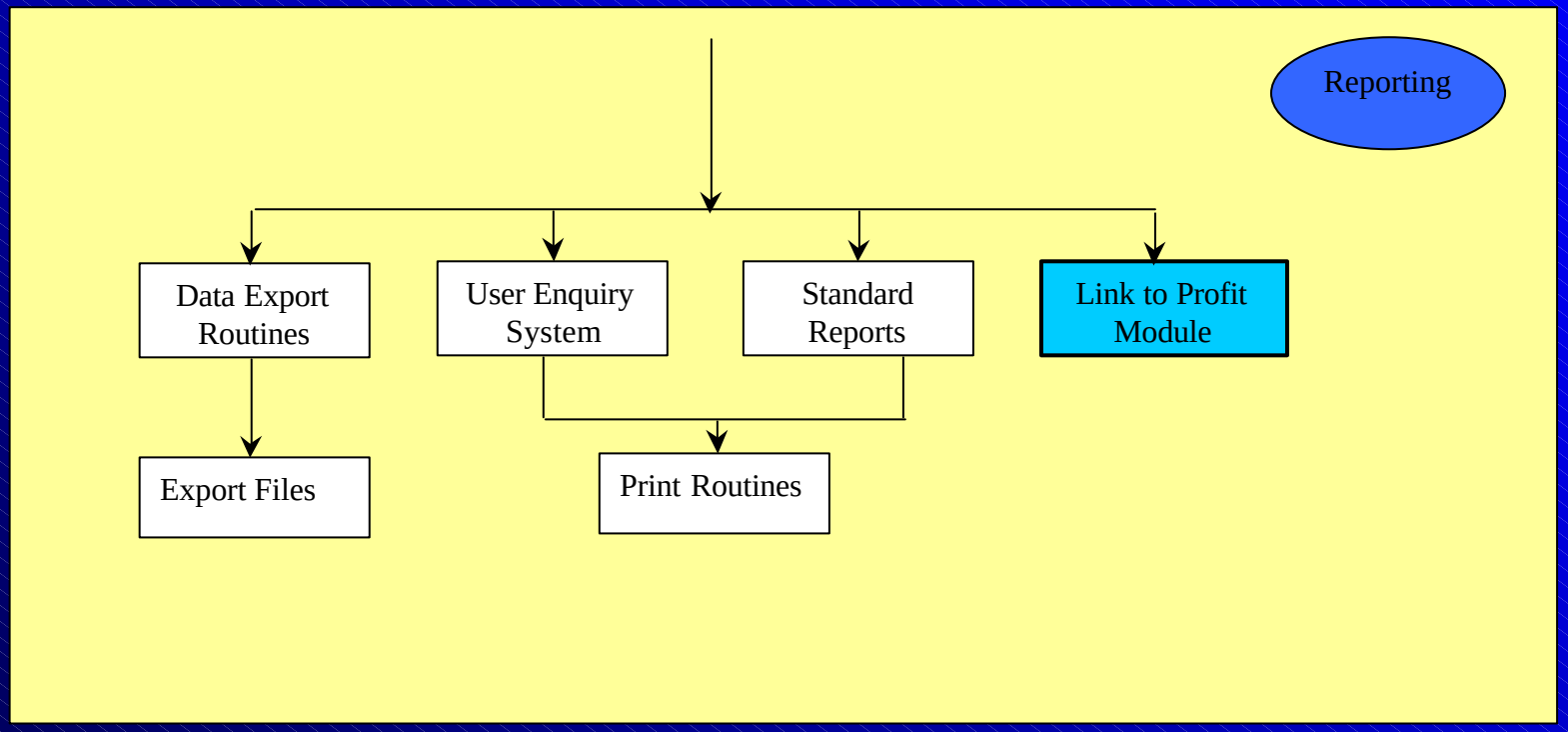
Reporting and Outputting

- Costs by service
- Service P&L
- Unit cost by service
- User queries (drill-down)
- Exporting facility to other Office applications

The Allocation Engine



Reporting/Outputting



Data Input

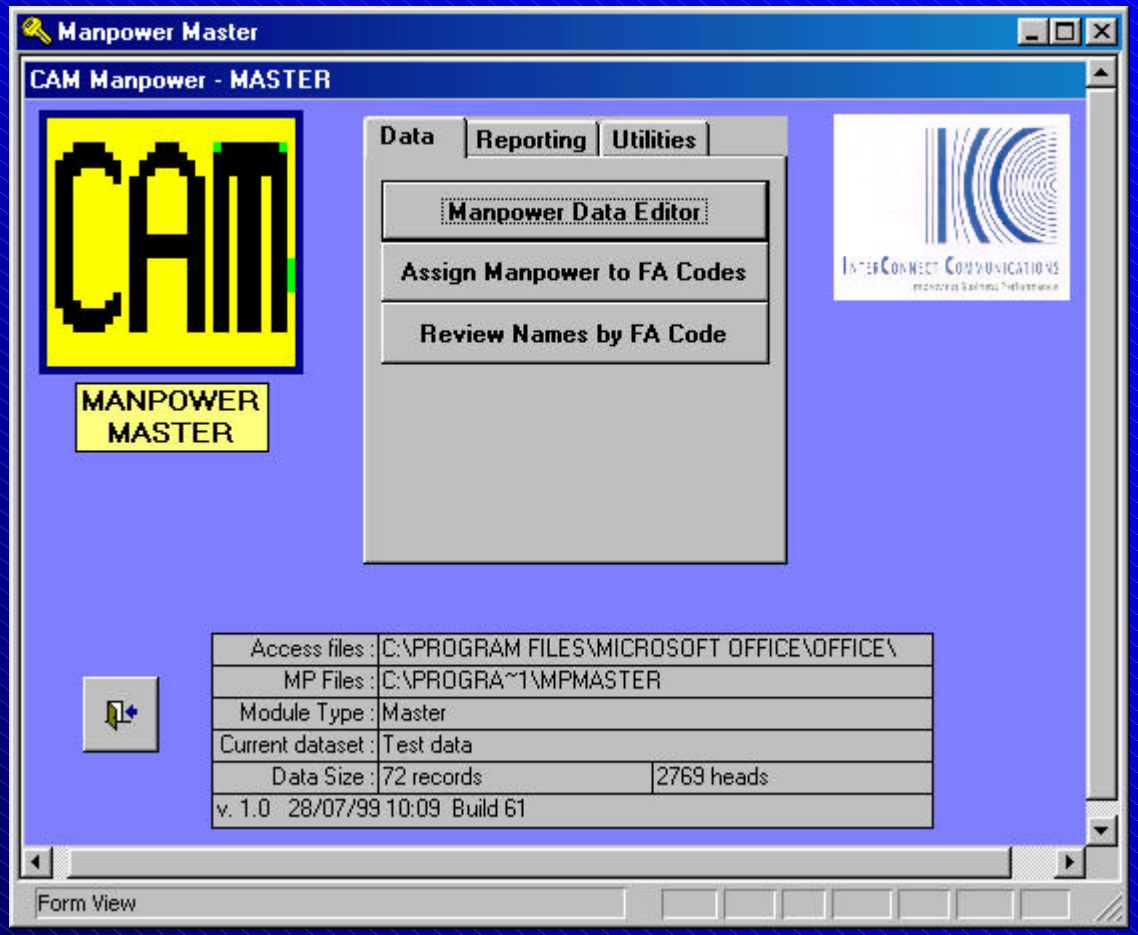
- General ledger
- Fixed assets register
- Manpower activity recording system
- Billing system
- Network monitoring and recording systems
- Manual inputs

General Ledger Costs

- Control Totals for:
  - Employment
  - Materials
  - Finance
  - Outpayments
  - Other
  - Depreciation

Depreciation

- Local Access Network
- Local Switching
- Transmission
- Trunk Switching
- Other Switching
- International
- Network Support
- Buildings
- Computing and IT
- Other



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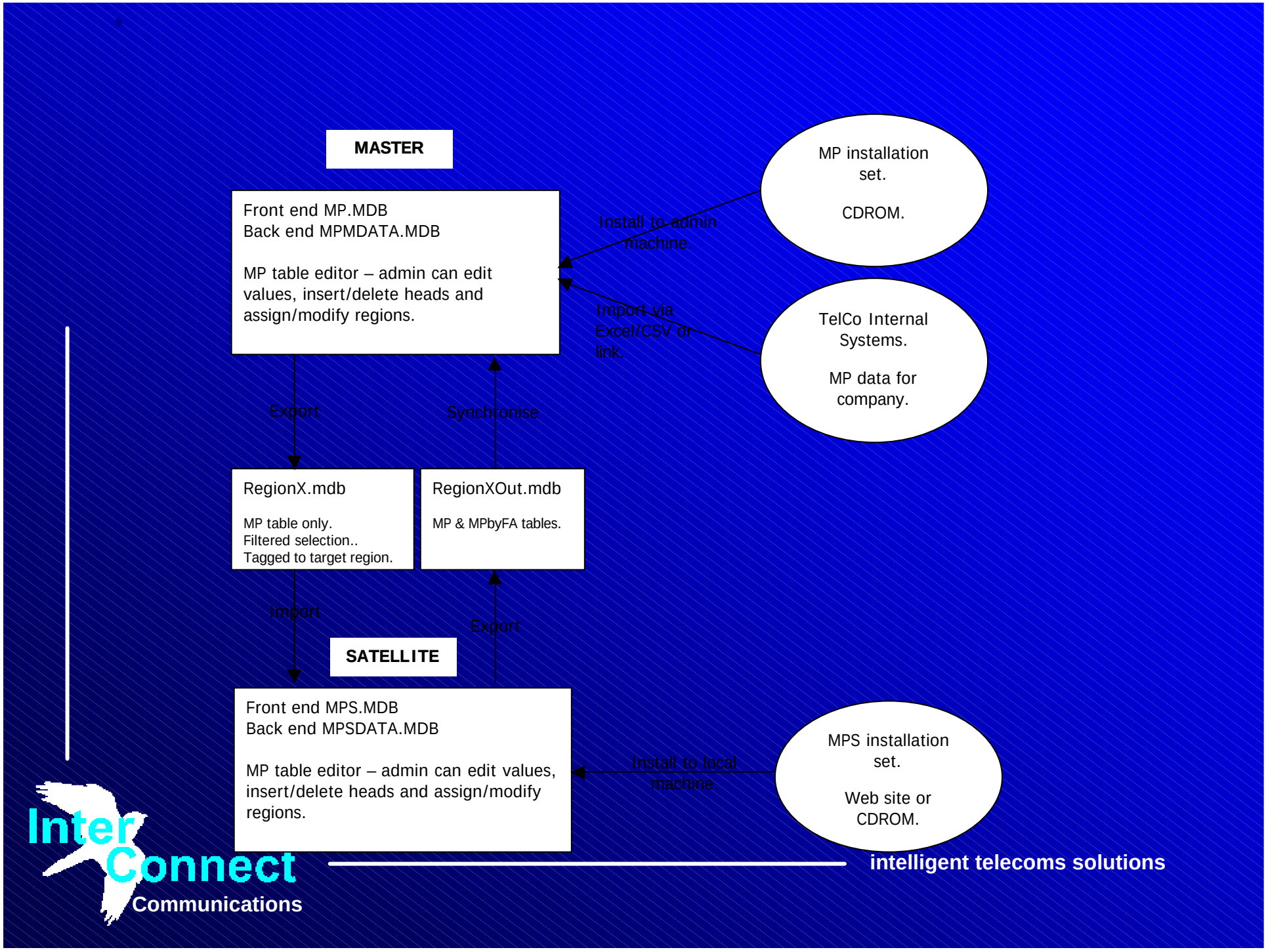
Why a Separate Module?

- Manpower identified as a key driver. ABC
- Overall Nos. of heads held centrally.
- But detailed knowledge of functions likely to be held locally.
- Master-satellite module devised
- A distributable data collection system
- Stand-alone utility but also a fully-integrated component of CAM

What Data to Collect?

- Numbers of heads - lowest level is an individual
- Groupable to ‘department’
- Salary data - by individual/groups
- Split by ‘region’ - user defines
- Datasets for compilation


MASTER
Front end MP.MDB
Back end MPMDATA.MDB
MP table editor – admin can edit values, insert/delete heads and assign/modify regions.
MP installation set.
CDROM.
Install to admin machine.
Import via Excel/CSV or link.
TelCo Internal Systems.
MP data for company.
Export
Synchronise
RegionX.mdb
MP table only.
Filtered selection..
Tagged to target region.
RegionXOut.mdb
MP & MPbyFA tables.
Import
Export
SATELLITE
Front end MPS.MDB
Back end MPSDATA.MDB
MP table editor – admin can edit values, insert/delete heads and assign/modify regions.
Install to local machine.
MPS installation set.
Web site or CDROM.
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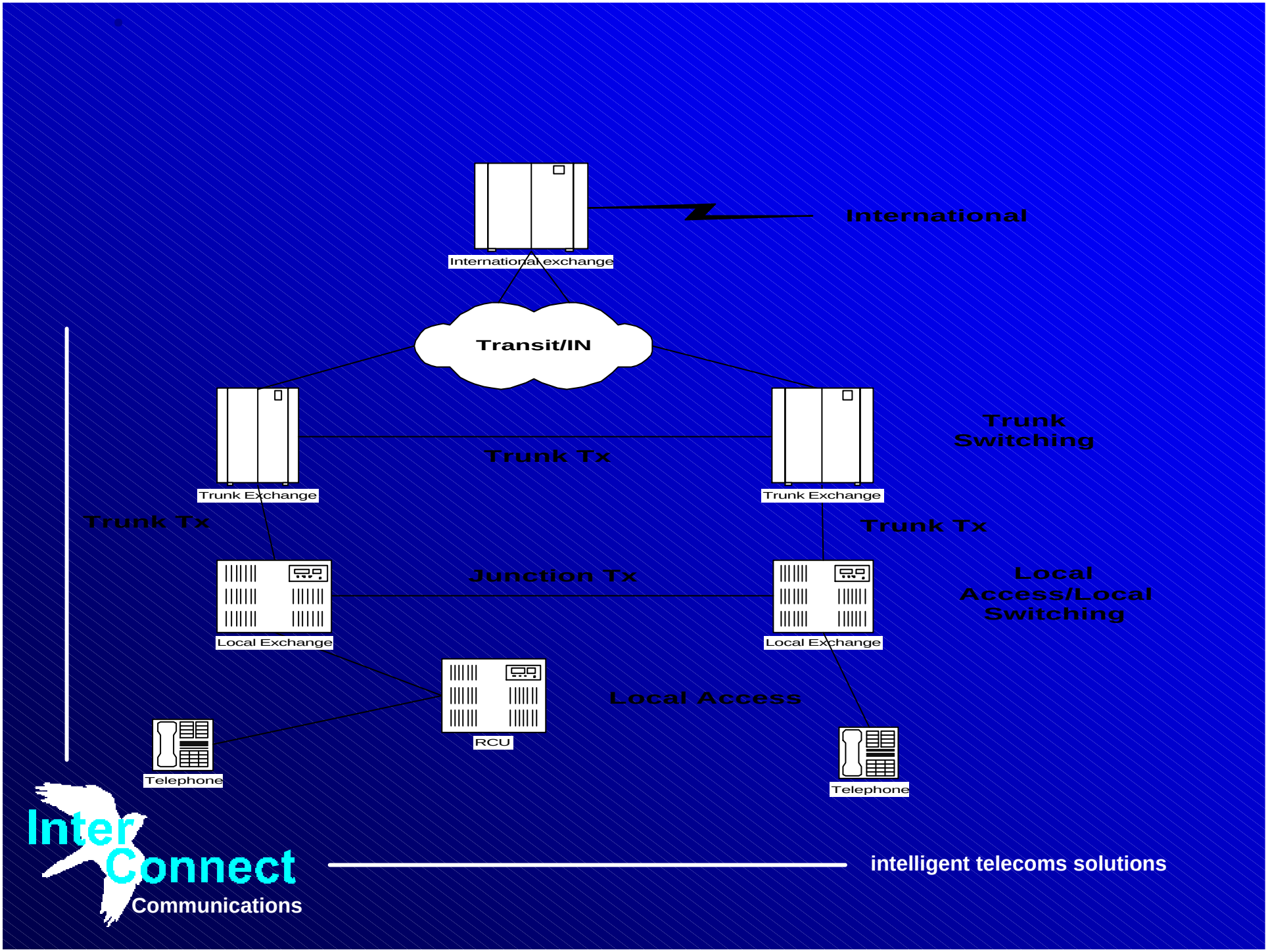
Drivers

- Financial and non financial data
  - Number of connections by type
  - Use of building space
  - Use of vehicles
  - Training
  - Fixed asset values
  - Revenue

Network Drivers - Calls

- Call routing
- Network configuration
- Regional traffic patterns
- Call numbers
- Call durations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Network Drivers - Leased Lines

- Number of leased lines
- Configuration
- Speed
- Location of A and B end
- Circuits used by network operator
  - International
  - RCU to host

Services

- Line connections
- Line rentals
- Calls by traffic type
- Other including data services, telex etc

Costs by Service

Allocation run : 15/03/00 16:20:09
Dataset Name : Test Data

Service Code	Service Description	Sel?	Employee	Materials	Financial	Outpayments	Depreciation	Other Expenses	Totals
FS101	Line Connections - Business	Yes	3,135,837	409,068	338,576		366,061	1,161,033	5,410,576
FS102	Line Connections - Residential	Yes	10,723,233	720,794	1,040,085		1,237,165	3,967,941	17,689,218
FS103	Line Connections - ISDN 2	Yes	554,193	439,992	84,144		65,794	206,287	1,350,409
FS104	Line Connections - ISDN 30	Yes	198,912	289,712	30,208		19,821	62,622	601,276
FS105	Line Connections - 2 wire analogue leased line	Yes	250,985	294,560	34,329		24,302	74,888	679,064
FS106	Line Connections - 4 wire analogue leased line	Yes	680,664	337,651	74,496		63,133	179,956	1,335,899
FS107	Line Connections - Digital leased line of 64 Kbit/s or less	Yes	224,685	343,037	47,762		26,108	87,086	728,678
FS108	Line Connections - Digital leased line of 2 Mbit/s and above	Yes	514,826	909,905	94,033		60,450	187,183	1,766,397
FS109	Line Connections - International Leased Lines	Yes	201,758	291,059	35,061		21,279	65,343	614,499
FS110	Line Connections - Payphones	Yes	811,604	2,398	54,666		58,570	162,575	1,089,813
	Total - Line Connections		**17,296,696**	**4,038,177**	**1,833,359**		**1,942,683**	**6,154,915**	**31,265,830**

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Unit Costs by Service

Allocation run : 15/03/00 16:20:09
Dataset Name : Test Data

Service Code	*Service Description*	Sel?	*Employee*	*Materials*	*Financial*	*Outpayments*	*Depreciation*	*Other Expenses*	*Totals*
FS201	Line Rental - Business	Yes	11.2589	6.7789	7.4741	0.0000	34.5485	12.4731	72.5334
FS202	Line Rental - Residential	Yes	10.9603	6.7789	6.9014	0.0000	34.3689	12.1787	71.1882
FS203	Line Rental - ISDN 2	Yes	41.8629	31.6006	21.9446	0.0000	91.9821	35.8018	223.1920
FS204	Line Rental - ISDN 30	Yes	4426.0071	5794.2088	1025.4845	0.0000	1856.9605	2355.3227	15457.9836
FS205	Line Rental - 2 wire analogue leased line	Yes	166.9510	189.5764	50.4324	0.0000	147.9118	80.4156	635.2872
FS206	Line Rental - 4 wire analogue leased line	Yes	155.7557	54.4725	51.4220	0.0000	180.3099	83.9317	525.8918
FS207	Line Rental - Digital leased line of 64 kbit/s or less	Yes	180.2386	71.0463	48.2475	0.0000	159.0022	87.0430	545.5775
FS208	Line Rental - Digital leased line of 2 Mbit/s and above	Yes	3323.0118	1138.5111	995.7615	0.0000	3855.4721	1677.9059	10990.6624
FS209	Line Rental - International Leased Lines	Yes	15104.0263	4315.3885	4097.2148	4576.1419	11895.7878	7283.0686	47271.6279
FS210	Line Rental - Payphones fixed annual cost	Yes	39.2747	116.6667	19.7883	0.0000	95.0103	30.1107	300.8507
	Avg - Line Rental		28.3844	14.5130	12.1324	1.6322	51.7838	20.9326	129.3786

Service P & L

Dataset Name : Test Data

Service Code	Service Description	Total Cost	Control Revenue	Surplus / Deficit	Margin %	Markup %
FS301	Calls - local	41,310,161	40,000,000	-1,310,161	-3.3	-3.2
FS302	Calls - regional (where applicable)	40,095,367	30,000,000	-10,095,367	-33.7	-25.2
FS303	Calls - national	37,971,909	75,000,000	37,028,091	49.4	97.5
FS304	Calls - outgoing to other mobile networks	16,788,408	20,000,000	3,211,592	16.1	19.1
FS305	Calls - outgoing to other fixed networks	11,342,517	10,000,000	-1,342,517	-13.4	-11.8
FS306	Calls - incoming from other mobile networks	1,722,393	2,000,000	277,607	13.9	16.1
FS307	Calls - incoming from other fixed networks	9,604,300	8,000,000	-1,604,300	-20.1	-16.7
FS308	Calls - international (outgoing)	26,204,307	85,750,000	59,545,693	69.4	227.2
FS309	Calls - international (receipts from overseas)	12,965,480	10,000,000	-2,965,480	-29.7	-22.9
FS310	Calls - to directory enquiry (including the cost of the enquiry	1,432,544	3,000,000	1,567,456	52.2	109.4
FS314	Calls - number translation services e.g. Auto Freephone	15,435,168	13,000,000	-2,435,168	-18.7	-15.8
	Total - Calls	**214,872,554**	**296,750,000**	**81,877,446**	**27.6**	**38.1**

Conclusions (1)

- Cost based interconnect charging a requirement
- Methodology adopted must be appropriate to local situation
- Cost allocation is a complex, time consuming activity
- Requires resources and input from throughout the company
- Network element costs are based on individual network configurations and utilisation

Conclusions (2)

- Pressure for incumbent operators to become “efficient”
- Now essential but undertaken for different reasons (LRIC v FAC)
  - regulatory
  - service pricing
  - P & L
- Detailed input data essential for cost allocation (garbage in - garbage out)

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Tel: **+ 44 1291 638400**
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email: **erictyson@icc-uk.com**
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