## Contents

Introduction	7
--------------	---

## Part 1

1	The OSI Reference Model	11
1.1	Functional layering	11
1.2	Services and protocols	13
1.3	OSI network service	16
1.4	OSI transport service	18
1.5	Mapping of the transport service onto network service: an example	19
1.6	OSI Management	21
2	Concepts in the framework of ISDN	25
2.1	A brief history	25
2.2	The D-channel protocol (layer 3)	30
2.2.1	Messages for call establishment, maintenance and clearing	30
2.2.2	Messages for the control of ISDN supplementary services	35
2.3	ISDN supplementary services	37
2.4	Broadband ISDN	38

## Part 2

3	Modelling of ISDN end-systems in terms of OSI	41
3.1	ISDN terminal configurations and OSI end-systems	41
3.2	Where should the D-channel protocol be located?	44
3.3	Omission of layer protocols	45
4	ISDN D-channel protocol and OSI network service	51
4.1	Mapping of the N-CONNECT service onto D-channel	
	protocol	51
4.2	Mapping of the N-DISCONNECT service onto D-channel	
	protocol	55
5	ISDN supplementary services from the viewpoint of OSI	
	network service	59
5.1	Alternating, an introductory example	59
5.1.1	Functions to supply alternating	60
5.1.2	Network Service versus Management Service	62
5.2	Structuring ISDN terminals from OSI services point of view	66



3

<b>6</b> 6.1 6.2 6.3 6.4	Extension of OSI network service	71 71 72 74 76
7	Management services as complement to the extended OSI	
	network service	79
7.1	Classification of management services	79
7.2	Connection-oriented management services which are not	
	related to network connections (M1 type services)	80
7.3	Connectionless management services which are not related	
	to network connections (M2 type services)	83
7.4	Connection-oriented management services which are related	
	to network connections (M3 type services)	85
8	Applying the structuring principles to ISDN	
	supplementary services	91
8.1	Alternating	94
8.1.1	Sequence of service primitives: global view	94
8.1.2	Sequence of service primitives: local view	97
8.1.3	Some remarks on distribution of control	105
8.2	Call completion	108
8.2.1	Sequence of service primitives: global view	108
8.2.2	Sequence of service primitives: local view	110
8.3	Incall modification	113
8.3.1	Sequence of service primitives: global view	113
8.3.2	Two network connections to handle "incall modification"	115
8.3.2.1	Sequence of service primitives: global view	116
8.3.2.2	Sequence of service primitives: local view	119

## Part 3

. •

9	Structure of an Application Programming Interface (API)	123
9.1	Position within the OSI reference model and functionality	
	of the API	123
9.2	A quick view on programming interfaces	126
9.2.1	COM/APPLI	126
9.2.2	NETBIOS®	12 <b>9</b>
9.2.3	Hayes® ISDNBIOS Interface	130
9.2.4	COMMON ISDN API	131
9.3	Relations between specification and implementation	132

10	Mapping and coordination (M&C): relations between service and protocol	135
	References	141
	Abbreviations	143
	Index	145

•