



A STRATEGIC STUDY OF STOCK EXCHANGE TECHNOLOGY



Table of contents

1.	Introduction	7
1.1	Scope and terms of the report.....	7
1.2	Trademarks and corporate branding.....	7
1.3	Disclaimer.....	7
2.	Summary of survey conclusions	9
2.1	Technology.....	9
2.2	Exchanges diversification model.....	11
2.3	US markets.....	11
2.4	Clearing houses, settlement organisations and central depositories (CSDs).....	12
2.4.1	CSD business drivers	13
2.5	Globalisation.....	14
2.5.1	Europe as a globalisation case for the rest of the world	14
2.6	Movement from solution age to consulting.....	15
2.7	Outsourcing models.....	16
2.8	Technology developments.....	16
2.8.1	Global communications	16
2.9	Global networks, SWIFT, Radianz.....	17
2.9.1	The Internet and IP-based technology	17
2.9.2	Exchanges as ISPs?	17
3.	Drivers affecting exchanges, CSDs and Their Technology	18
3.1	Development of exchanges and CSD Organisations.....	18
3.1.1	Providing value - adding new products	18
3.1.2	Trends in development of CSDs	19
3.1.3	Drivers to development of exchanges	19
3.1.4	Trends in development of exchanges	23
3.1.5	Exchange finance - revenue streams and expenditure	25
3.1.6	Exchange markets	25
3.1.7	Exchange diversification	27
3.1.8	Volumes and trades	29
3.2	Main developments in exchange and CSD IT.....	32
3.2.1	Dynamic standards-based environment	32
3.2.2	Communications	34
3.2.3	Delivering information technology	37
3.2.4	Industry consolidation and integrated services	40
3.2.5	The next generation	42
4.	Exchange by exchange	44
4.1	North America.....	44
4.1.1	U.S.A. - Structure of the US markets	44
4.1.2	American stock exchange (AMEX)	48
4.1.3	Chicago board of trade	51
4.1.4	Chicago board options exchange	52
4.1.5	Chicago mercantile exchange	55
4.1.6	NASDAQ (USA)	58
4.1.7	The New York stock exchange	67
4.1.8	Other US Markets	72
4.1.9	Canada	76
4.2	Caribbean.....	78
4.2.1	Bahamas	78

4.2.2	Barbados.....	78
4.2.3	Bermuda.....	78
4.2.4	Eastern Caribbean Stock Exchange.....	78
4.2.5	Jamaica.....	79
4.2.6	Trinidad and Tobago.....	79
4.3	Latin America.....	80
4.3.1	Argentina.....	80
4.3.2	Bolivia.....	80
4.3.3	Brazil.....	81
4.3.4	Chile.....	81
4.3.5	Colombia.....	82
4.3.6	Costa Rica.....	82
4.3.7	Ecuador.....	82
4.3.8	Mexico.....	83
4.3.9	Panama.....	83
4.3.10	Peru.....	83
4.3.11	Uruguay.....	84
4.3.12	Venezuela.....	84
4.4	Nordic and Baltic.....	85
4.4.1	Denmark.....	86
4.4.2	Finland.....	86
4.4.3	Iceland.....	86
4.4.4	Norway.....	87
4.4.5	Sweden.....	87
4.5	Western Europe.....	88
4.5.1	Austria.....	88
4.5.2	Belgium.....	89
4.5.3	France.....	92
4.5.4	Germany.....	93
4.5.5	Greece.....	98
4.5.6	Ireland (Republic of).....	99
4.5.7	Italy.....	99
4.5.8	Luxembourg.....	100
4.5.9	Malta.....	100
4.5.10	Netherlands.....	100
4.5.11	Portugal.....	101
4.5.12	Spain.....	101
4.5.13	Switzerland.....	102
4.5.14	SIS Sega Intersettle.....	104
4.5.15	United Kingdom.....	105
4.6	Central & Eastern Europe.....	117
4.6.1	Bulgaria.....	118
4.6.2	Croatia.....	118
4.6.3	Czech Republic.....	118
4.6.4	Estonia.....	119
4.6.5	Hungary.....	119
4.6.6	Latvia.....	119
4.6.7	Lithuania.....	119
4.6.8	Poland.....	120
4.6.9	Romania.....	121
4.6.10	Russia.....	121
4.6.11	Slovakia.....	121
4.6.12	Slovenia.....	122



4.7	Middle East.....	123
4.7.1	Bahrain.....	123
4.7.2	Cyprus.....	123
4.7.3	United Arab Emirates.....	124
4.7.4	Iran.....	124
4.7.5	Israel.....	124
4.7.6	Jordan.....	125
4.7.7	Kuwait.....	125
4.7.8	Lebanon.....	125
4.7.9	Palestine.....	125
4.7.10	Pakistan.....	126
4.7.11	Qatar.....	126
4.7.12	Saudi Arabia.....	126
4.7.13	Turkey.....	127
4.8	Africa.....	128
4.8.1	Egypt.....	128
4.8.2	Kenya.....	128
4.8.3	Mauritius.....	129
4.8.4	Morocco.....	129
4.8.5	Nigeria.....	129
4.8.6	South Africa.....	129
4.8.7	Tunisia.....	130
4.8.8	Gabon.....	130
4.9	Asian Pacific.....	132
4.9.1	Australia.....	132
4.9.2	China - Hong Kong.....	133
4.9.3	Japan.....	137
4.9.4	New Zealand.....	142
4.10	Asian Emergent.....	143
4.10.1	Bangladesh.....	143
4.10.2	Sri Lanka.....	143
4.10.3	India.....	144
4.10.4	Indonesia.....	148
4.10.5	Korea.....	148
4.10.6	Malaysia.....	149
4.10.7	Philippines.....	150
4.10.8	Singapore.....	151
4.10.9	Taiwan.....	152
4.10.10	Thailand.....	152
5.	Analysis of Solution Providers.....	153
5.1	Share by product and supplier.....	153
5.1.1	Trading Technology perspective.....	155
5.1.2	Future needs of exchanges.....	156
5.1.3	Future needs of CSDs.....	156
5.2	Architectural overview of exchange solutions.....	156
5.3	CMA-Percival.....	160
5.3.1	Depository 2000.....	160
5.3.2	Trade 2000.....	162
5.4	OM Technology.....	163
5.4.1	CLICK.....	163
5.4.2	Saxess.....	165
5.4.3	Secur.....	167
5.4.4	Exigo.....	168



5.5	OpenGETS.....	169
5.5.1	SITREL.....	169
5.5.2	SITREL-PI.....	171
5.6	Computershare.....	171
5.7	ATOS Euronext.....	173
5.7.1	NSC.....	174
5.7.2	Clearing 21.....	176
5.8	Formerly EFA systems (now owned by Computershare).....	177
5.8.1	Horizon.....	177
5.8.2	Equator.....	179
5.9	Millennium IT.....	181
5.9.1	Mit~e.Effimark.....	181
5.9.2	Mit~e.Settlement and Mit~e.Depository.....	184
5.10	Elind.....	184
5.10.1	Stride.....	185
5.10.2	Infinet Clearing and Settlement.....	186
5.11	Palion.....	188
5.11.1	Derivative Clearing system.....	188
5.12	Cinnober.....	190
5.12.1	Trade Express.....	190
5.13	CMC Informatics.....	191
5.13.1	Vector.....	191
5.13.2	Vedas.....	192
5.13.3	V-Star.....	193
5.14	IndigoMarkets.....	194
5.14.1	TESA.....	195
5.15	Tata Consulting Services (TCS).....	196
5.15.1	EClearSettle.....	196
5.15.2	Tradex.....	198
6.	Appendix A: Stock Exchanges, a brief history.....	199
7.	Appendix B: Market Share of hardware providers.....	201
7.1	Market share of Stock Exchanges technology platform.....	201
7.2	Share of CSD technology platform.....	204
8.	Appendix C: Comparison of trading solution providers.....	205