

Index

# Table of Contents

Table of Contents ..... i

List of Figures ..... vi

Executive summary ..... 1

1 Mobile navigation solutions ..... 3

    1.1 Portable navigation solutions ..... 3

        1.1.1 Evolution of portable navigation systems ..... 3

        1.1.2 Usability and value aspects ..... 5

    1.2 Enabling technologies ..... 8

        1.2.1 Positioning technologies ..... 9

        1.2.2 Navigation software platforms ..... 10

        1.2.3 Digital maps and content ..... 11

    1.3 Handset-based navigation services ..... 13

        1.3.1 Turn-by-turn navigation software and services ..... 14

        1.3.2 On-board navigation software ..... 16

        1.3.3 Off-board navigation services ..... 17

    1.4 Mobile navigation services value-chain ..... 17

        1.4.1 Content providers ..... 18

        1.4.2 Navigation software solution vendors ..... 18

        1.4.3 Device vendors ..... 19

        1.4.4 Mobile network operators ..... 19

        1.4.5 Service providers ..... 20

2 Map data and content providers ..... 21

    2.1 Digital map data suppliers ..... 22

        2.1.1 NAVTEQ ..... 23

        2.1.2 Tele Atlas ..... 25

        2.1.3 AND ..... 27

    2.2 Directory publishers ..... 27

        2.2.1 PagesJaunes ..... 28

2.2.2	Seat Pagine Gialle .....	28
2.2.3	The Yell Group .....	28
2.3	Travel guide, POI data and weather information providers.....	29
2.3.1	CustomWeather.....	29
2.3.2	Fodor's .....	29
2.3.3	Foreca .....	29
2.3.4	ViaMichelin .....	30
2.3.5	Wcities .....	30
2.4	Traffic information providers.....	31
2.4.1	Inrix.....	31
2.4.2	ITIS Holdings.....	31
2.4.3	Mediamobile.....	32
2.4.4	SmartRoute Systems.....	32
2.4.5	Trafficmaster.....	33
2.4.6	T-Systems Traffic.....	33
3	Navigation software developers .....	35
3.1	On-board navigation software developers .....	35
3.1.1	ALK .....	36
3.1.2	Augmentra.....	37
3.1.3	CosmicNavigation .....	38
3.1.4	Intrinsyc Software.....	39
3.1.5	NAVIGON .....	40
3.1.6	NavNGo.....	40
3.1.7	ROUTE 66.....	41
3.1.8	Sygic.....	41
3.1.9	Tracker .....	42
3.2	Server-based navigation solution developers .....	44
3.3	Ad-funded navigation services .....	46
3.3.1	Amaze GPS from LocatioNet Systems.....	46
3.3.2	Nav4All .....	47
3.4	Premium navigation services.....	48
3.4.1	3DVU .....	48

- 3.4.2 GeoMicro ..... 48
- 3.4.3 NaviExpert ..... 49
- 3.4.4 NAVITIME JAPAN ..... 50
- 3.4.5 TeleNav ..... 50
- 3.4.6 Trimble..... 52
- 3.4.7 Wayfinder Systems..... 53
- 3.5 White-label navigation service providers ..... 54
  - 3.5.1 Appello Systems ..... 55
  - 3.5.2 Jentro Technologies..... 56
  - 3.5.3 Masternaut..... 57
  - 3.5.4 Networks In Motion ..... 58
  - 3.5.5 TeleCommunication Systems ..... 59
  - 3.5.6 Telmap..... 59
  - 3.5.7 WaveMarket..... 60
- 4 Mobile operator service offerings ..... 63
  - 4.1 Navigation services from North American network operators ..... 63
    - 4.1.1 Alltel Wireless ..... 65
    - 4.1.2 AT&T Wireless ..... 65
    - 4.1.3 Bell Mobility ..... 66
    - 4.1.4 Rogers Wireless ..... 66
    - 4.1.5 Sprint Nextel..... 67
    - 4.1.6 TELUS ..... 68
    - 4.1.7 Verizon Wireless..... 68
  - 4.2 European mobile operator navigation services..... 69
    - 4.2.1 Orange Group ..... 71
    - 4.2.2 T-Mobile..... 73
    - 4.2.3 Telefónica Group..... 75
    - 4.2.4 Telekom Austria group..... 76
    - 4.2.5 Telenor Group ..... 78
    - 4.2.6 TeliaSonera Group ..... 80
    - 4.2.7 Vodafone Group..... 81
- 5 Branded service offerings..... 85

5.1	Directory publishers and search engines.....	85
5.1.1	Ask.com.....	86
5.1.2	DasÖrtliche.....	86
5.1.3	Eniro.....	86
5.1.4	Google.....	87
5.1.5	Microsoft.....	88
5.1.6	Yahoo!.....	89
5.2	Mapping and travel portal providers.....	90
5.2.1	Falk.....	90
5.2.2	Mappy.....	91
5.2.3	MapQuest.....	92
5.2.4	Rand McNally.....	93
5.3	Automobile clubs.....	94
5.3.1	AAA.....	94
5.3.2	ADAC.....	95
6	Device vendor offerings.....	97
6.1	Handset manufacturers.....	97
6.1.1	Nokia.....	98
6.1.2	Samsung Electronics.....	101
6.1.3	Motorola.....	102
6.1.4	Sony Ericsson.....	103
6.1.5	Research In Motion.....	104
6.1.6	HTC.....	105
6.1.7	Palm.....	106
6.2	PND vendors.....	106
6.2.1	Garmin.....	107
6.2.2	NDrive.....	109
6.2.3	Mio Technology.....	109
6.2.4	TomTom.....	110
7	Market forecasts and trends.....	111
7.1	Market trends.....	111
7.1.1	The success of PNDs drives consumer interest in navigation.....	111

- 7.1.2 Growing adoption of GPS in mobile handsets ..... 112
- 7.1.3 The emergence of mobile location-based services ..... 113
- 7.1.4 Evolution of business models and sales channels for mobile navigation ..... 114
- 7.1.5 Evolution of content and value-added services ..... 114
- 7.2 Mobile navigation software market analysis..... 115
  - 7.2.1 Vendor market shares ..... 115
  - 7.2.2 Market forecast..... 116
- 7.3 Mobile navigation services in Europe..... 117
  - 7.3.1 Service provider market shares ..... 118
  - 7.3.2 Subscriber and revenues forecasts ..... 119
- 7.4 Mobile navigation services in North America ..... 121
  - 7.4.1 Service provider market shares ..... 121
  - 7.4.2 Subscriber and revenues forecasts ..... 122
- Glossary ..... 125

## Index

## List of Figures

Figure 1.1: Evolution of portable navigation systems.....	4
Figure 1.2: Advantages and disadvantages of handset-based navigation solutions.....	6
Figure 1.3: Smartphones with GPS and navigation software.....	7
Figure 1.4: Mapping and navigation server platform.....	10
Figure 1.5: Handset-based turn-by-turn navigation services .....	15
Figure 1.6: Advantages and disadvantages of on-board and off-board navigation.....	16
Figure 1.7: Handset mapping and navigation value chain.....	17
Figure 2.1: Examples of digital map and content providers.....	22
Figure 2.2: International digital map data suppliers (2007) .....	23
Figure 3.1: On-board street navigation software vendors .....	35
Figure 3.2: Augmentra ViewRanger screenshots .....	37
Figure 3.3: Off-board navigation technology vendors.....	43
Figure 3.4: Off-board navigation service feature comparison .....	45
Figure 3.5: Trimble Outdoors services and prices .....	52
Figure 3.6: Wayfinder user base.....	54
Figure 4.1: Navigation offerings from North American operators (September 2008) .....	64
Figure 4.2: Navigation offerings from European operators and MVNOs (September 2008) ...	70
Figure 4.3: Price examples for O <sub>2</sub> Navigace .....	76
Figure 4.4: A1 Navi navigation service packages.....	77
Figure 4.5: Price examples for Pannon Navigator .....	79
Figure 5.1: Google Maps for mobile screenshots .....	87
Figure 5.2: Yahoo! Go screenshots.....	89
Figure 6.1: Nokia smartphones with GPS and Nokia Maps software .....	99
Figure 6.2: Pricing examples for Nokia Maps 2.0 (September 2008).....	100
Figure 6.3: The Garmin nüviphone .....	108
Figure 7.1: Annual shipments of GPS-equipped GSM/UMTS handsets (2007–2012).....	112
Figure 7.2: Market share for on-board navigation software (EU, NA 2007) .....	115
Figure 7.3: OEM on-board navigation software sales Europe and N.A. (2007–2014) .....	116

Figure 7.4: Annual sales of on-board navigation software Europe and N.A. (2008–2014) .... 117  
Figure 7.5: Market share for off-board navigation services (Europe 2006-1H 2008) ..... 118  
Figure 7.6: Mobile navigation service subscribers (Europe 2007–2014) ..... 120  
Figure 7.7: Revenues from premium and ad-funded navigation services, EU (2008–2014).. 121  
Figure 7.8: Market share for off-board navigation services (North America 2006–2008)..... 122  
Figure 7.9: Mobile navigation service subscribers, North America (2007-2014)..... 123  
Figure 7.10: Revenues from premium and ad-funded navigation services NA (2008-2014) . 124

