

MOBILE - INNOVATION DRIVER -

Life without it seems hardly conceivable: the mobile phone, just like the Internet, has become firmly embedded in our daily lives. It is the medium of choice for an entire generation, and it has an increasing influence on activities in both business and government.

More than 110 million active SIM cards are currently registered in Germany. In other words, over the last twenty years the mobile communications industry has achieved one of the most significant levels of market penetration in the history of communication technologies. New business models in the mobile sector are the growth

drivers for an entire industry, and the mobile phone is becoming a key technology in many up- and downstream areas.

Mobile broadband

Broadband access on the go – mostly via 3G broadband networks based on UMTS technology¹, but increasingly also 4G networks primarily using the LTE standard¹. In 2013 alone 28 million smartphones and 5 mill. tablets will be sold. The demand for mobile broadband usage is rising.

 Selected Düsseldorf companies: Huawei, Nokia Solutions and Networks, Vodafone Deutschland, ZTE

Mobile marketing

The mobile phone has been in use as an advertising medium for a whole decade now. This has led to the development of a wide range of mobile advertising formats and, to the same extent, the emergence of a vast number of service providers.

Selected Düsseldorf companies: Alcatel-Lucent, apprupt, Düsseldorf Airport DUS, Gettings, madvertise media, MATERNA newmedia, Mobile Marketers, Sony Mobile Communications, Velti

Branded reseller²/MVNO³

MVNO-based business models – at the end of 2013 there are already more than 180 'virtual' mobile brands on the German market. Some of them are subsidiaries of network operators, but the majority are collaborations between network operators or MVNEs⁴ and companies from outside the industry that have no core mobile telecom business but do have established sales channels, customer bases and their own branding.

 Selected Düsseldorf companies: Ortel Mobile, ring Mobilfunk, SIMFONICS, simyo

- 1 LTE (4G), UMTS (3G) LTE ('long term evolution', 4G = 4th generation) is the next-generation standard for mobile data transmission replacing UMTS ('universal mobile telecommunications system', 3G = 3rd generation).
- 2 BRANDED RESELLER The most common type of MVNO business in Germany. This business model focuses on marketing and sales of branded SIM cards (see also MVNO, MVNE).
- 3 MVNO The Mobile Virtual Network Operator business model involves network operators or MVNEs (see below) and resellers of mobile communication services who have no network resources of their own.
- 4 MVNE A Mobile Virtual Network Enabler is one party in a full MVNO relationship. Unlike full MVNOs, MVNEs do not distribute mobile products directly, but via a partner company.

M2M communication 6

Machine-to-machine communication (M2M) based on personal SIM cards is making inroads into ever more areas. Applications include the security, healthcare and banking sector and many other industries like retail, automobile, transport and

Selected Düsseldorf companies: Cumulocity, Ericsson, MediaanABS Deutschland, M2M Alliance, **SIMFONICS**



Mobile health monitoring and remote diagnosis – the ability to record bodily functions and health habits on a daily basis will revolutionise medicine.

Selected Düsseldorf companies: Kaasa health, Jommi Online Marketing, MEDISANA, SHL Telemedizin, Tiptel.com

Mobile Ticketing, payment and banking

Payment and other financial transactions over the phone - modern SIM cards enable users to add electronic cash and credit card functionality to their mobile phones. Transmitting TANs via SMS will make online banking highly secure.

Selected Düsseldorf companies: net mobile, Rheinbahn, PricewaterhouseCoopers, Vodafone Deutschland



Mobile security

Secure transmission of voice services and data - encryption software installed on mobile phones enables secure voice transmission and safe operation of business-critical applications. Security is an important success lever.

Selected Düsseldorf companies: @one IT, Protegon, Secusmart

mobile commerce

Creating a mobile link from retailers to consumers, RFID⁷ technologies help optimise supply chain procedures, while NFC⁸ and SIM cards make shopping 'smart' and increasingly

Selected Düsseldorf companies: Emmas Enkel. Hierbeidir.com, METRO GROUP. re:Store (Apple-Premium-Reseller), **SES RFID Solutions**

mLearning

Accessing knowledge bases over the phone - while mobile access to education is still in its infancy, it is definitely a growth market and mobile learning resources are sure to expand.

Selected Düsseldorf companies: Babiel e-Information. Vela Entertainment Studios, Coachme

Mobile apps⁵

Applications for mobile devices: in 2012 1.7 bill. apps were downloaded - that is 80% more than the previous year -, generating sales revenue of 430 mill. euros. The growth in smartphone penetration has given the app economy a tremendous

Selected Düsseldorf companies: AppCom Interactive, Appseleration, bam! interactive marketing, Hot Chili Apps. net mobile, Nokia, Verlagsgruppe Handelsblatt

5 APP This short form of 'application' denotes all kinds of end-user resources for modern smartphones. As a rule, apps can be downloaded using store software integrated in the phone's operating system.

6 M2M 'Machine-to-machine' transactions are defined as the automated bidirectional communication between technical units such as machines, devices or systems - in this case over a mobile network. M2M applications streamline business processes.

7 RFID 'Radio frequency identification' serves to identify and track objects using radio waves. RFID technology records and stores data via a system of transponders and interrogators.

8 NFC 'Near field communication' is a communication technology standard enabling the wireless exchange of data over a short dis-



MOBILE DUSSELDORF

Home to the network operators Vodafone Deutschland and E-Plus, Düsseldorf has long been a powerhouse of the German mobile telecommunications industry. Groundbreaking industry innovations – such as the MVNO business model, LTE projects or the launch of RFID – were all started and successfullymarketed by Düsseldorf players. The city has long been a prime location for mobile telecommunications companies, exerting enormous attraction on all levels of the value creation hierarchy, from Asian infrastructure giants to innovative SMEs that have formed locally. Düsseldorf is home to more than 1,500 companies from the information and communications technology sector. Such a concentration of companies, industry associations and institutions has made Düsseldorf into a unique ecosystem in the mobile sector on a world scale.

More information: www.duesseldorf.de/mobile-dus

and: www.mobile-dus.de



More than 50% of mobile phone sales in Germany are controlled from the Düsseldorf region.



More than 50% of all German mobile telecommunications SIM cards come from Düsseldorf.



Düsseldorf is home to global players and innovative mobile sector companies on all levels of the value chain. This creates synergy and drives collaboration between local enterprises.



International industry giants like Huawei, METRO GROUP and Vodafone Deutschland initiate pilot projects in Düsseldorf to test promising future technologies such as NFC, LTE and RFID.



Düsseldorf has more employees in mobile telecommunications than any other city in Germany.



North Rhine-Westphalia is home to the biggest telecommunications providers in Germany and has one of the largest regional telecommunications markets in Europe.



Düsseldorf is Germany's no. 1 location for technology-oriented company start-ups.



In Düsseldorf business angels and investors provide venture capital resources for high-tech start-ups through to the mobile incubator in the K-LAN ICT knowledge network.



Düsseldorf is home to many industry associations and business networks related to the mobile sector:

- Fachgruppe Mobile im BVDW ('Mobile' Specialist Group)
- · Digital City Düsseldorf
- The German Council of the Mobile Marketing Association
- The local chapter of the MobileMonday community



Düsseldorf is host to the M2M Summit, a congress that has developed into one of the most important events in the M2M environment in recent years.

DÜSSELDORF The headquarters of the mobile industry offers international companies ideal conditions and services that are precisely tailored to the needs of global entrepreneurs. The International Business Service department at the Office of Economic Development is the point of contact for all matters of interest to foreign businesses. Designed as a one-stop agency, it lends support in setting up and developing subsidiaries, provides relevant information on the Düsseldorf region, helps find suitable commercial real estate, provides advice in applying for residence and work permits, offers an advisory service to identify and contact public authorities, and mediates contacts to country or industry networks in Düsseldorf. International specialists at the Office of Economic Development speak all major business languages.

NORTH AMERICA The motherland of the Internet and home to some of the driving forces of the mobile sector such as Apple, Microsoft, Google and Yahoo. With 450 companies represented in the Düsseldorf region, the USA has long been one of our strongest trading partners. The Office of Economic Development has close connections to business partners in the US and regularly organises presentations promoting the Düsseldorf region there. North American corporations such as Oracle, BlackBerry, HP Enterprise Services and CGI all operate successfully from Düsseldorf.

EUROPE Its leading role in global mobile telecommunications manifest itself in the establishment of world market leaders in all key segments of mobile high-tech. The concentration of European players in Düsseldorf, in particular the unmatched convergence of key corporate initiatives in the domain of research and development, make the Düsseldorf region Europe's Mobile hub. Companies like Vodafone (UK), KPN International/E-Plus (Netherlands), Alcatel-Lucent (France) and Ericsson (Sweden) have all recently reiterated their commitment to the Düsseldorf location.

A GLOBAL NETWORK

Düsseldorf maintains excellent political and business relationships to the key mobile markets.



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Vodafone Deutschland, E-Plus Mobilfunk, SIMFONICS Alcatel-Lucent, Ericsson, Huawei, NEC, Nokia Solutions and Networks, Oracle, Q2WEB, Renesas Electronics, Yokowo, ZTE Atos, CGI, Comarch, Comptel, HP Enterprise Services, IBM, Tata Consultancy Services, Tech Mahindra AY YILDIZ Communications, ecotel, freenet, Ortel Mobile, ring Mobilfunk, simyo BlackBerry, Hewlett-Packard, Intermec Technologies, novero, Sony Mobile Communications, Tiptel.com, Toshiba Europe BAMM.tv, RP Digital, Schwann Verlag, Ubisoft, Verlagsgruppe Handelsblatt @one IT, AppCom Interactive, Appseleration, Babiel e-Information, Bosbec Communication, Cliq Digital, Coachme, Code One, Cumulocity, DOCOMO Deutschland, dreieque, ECHTZEIT ZEITMANAGEMENT, Hot Chili Apps, Inmote, Jommi Online Marketing, Kaasa solution, Live Reply, MEDISANA, mischel & söhne communication, net mobile, Nokia, PiXanta, Protegon, RHEINFABRIK, Secusmart, SES RFID Solutions, SHL Telemedizin, sipgate, Sogeti, Slenderiser, Sybase, Vela Entertainment Studios, Vionlabs apprupt, bam! interactive marketing, BBDO, Euroweb, Gettings, GREY Worldwide, GroupM, Düsseldorf Airport DUS, madvertise media, MATERNA newmedia, MediaCom, OMNICOM Media Group Germany, TWT Interactive, Velti, VivaKi ElectronicPartner, Emmas Enkel, Hierbeidir.com, METRO GROUP, Mitsui, re:Store (Apple-Premium-Reseller) 1stMOVER, 7P Solutions & Consulting , AcademicIT, A.T. Kearney, Booz & Company, effmertconsult, listérus & partners, McKinsey & Company, MediaanABS Deutschland, Mobile Marketers, MSERVICES, Shark Holding, Valuedfriends, P3 communications, PriceWaterhouseCoopers, troido android consulting, BVDW Fachgruppe Mobile, Deutscher Marketing-Verband, Digitale Stadt Düsseldorf, Digital Markets, K-LAN, Landesanstalt für Medien Nordrhein-Westfalen (LfM), Messe Düsseldorf, Mobile Marketing Association, MobileMonday Düsseldorf, Open Device Lab Düsseldorf, Rheinbahn, Vodafone Enterprise Plenum



The eleven levels of the mobile sector value chain and selected companies.

- 01 Networks, MVNEs
- 02 Infrastructure, appliances
- 03 Managed services, outsourcing
- 04 Service providers, MVNOs, branded resellers
- 05 Mobile devices
- 06 Content providers
- 07 Value-added services, mobile apps and solutions
- 08 Mobile marketing / advertising / media
- 09 Trade, services, M-commerce
- 10 Consulting
- 11 Trade associations, institutions, disseminators







Networks, MVNEs 01

Selected Düsseldorf companies: Vodafone Deutschland, E-Plus Mobilfunk, SIMFONIOS



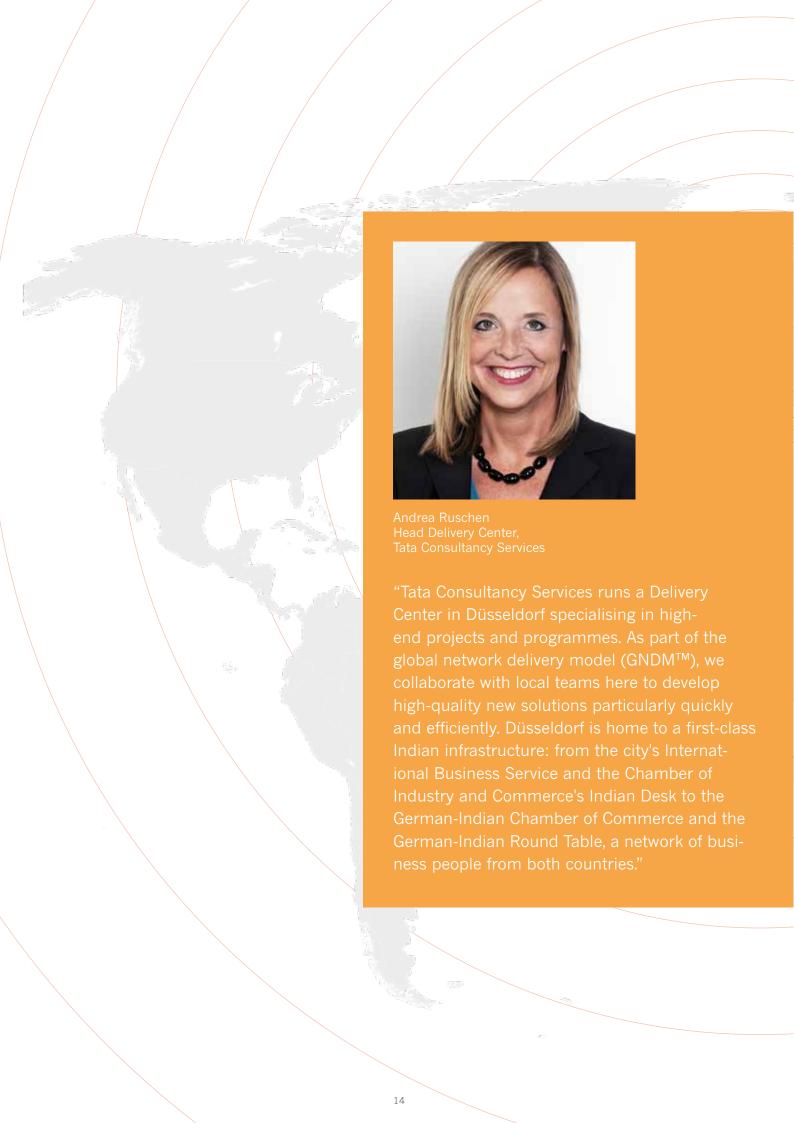
Olaf Reus Board Member, Huawei Technologies Deutschland

"Huawei's West European and German headquarters are located in Düsseldorf. The lease of a new building with some 20,000 square metres of space to accommodate our 900 employees and to amalgamate our individual sites in the city area in until 2014 is clear proof of our belief in Düsseldorf as a business location. For us Düsseldorf is the centre of the mobile technology industry and the place where numerous customers, suppliers and business partners are based. That is why we moved here in 2007 and are continuing to expand our involvement here."



Infrastructure, appliances

Selected Düsseldorf companies: Alcatel-Lucent, Ericsson, Huawei, NEC, Nokia Solutions and Networks, Oracle, Q2WEB, Renesas Electronics, Yokowo, ZTE





Managed services, outsourcing

Selected Düsseldorf companies:
 Atos, Comarch, Comptel, CGI, HP Enterprise
 Services, IBM, Tata Consultancy Services,



Nicolas Biagosch CEO, simyo GmbH

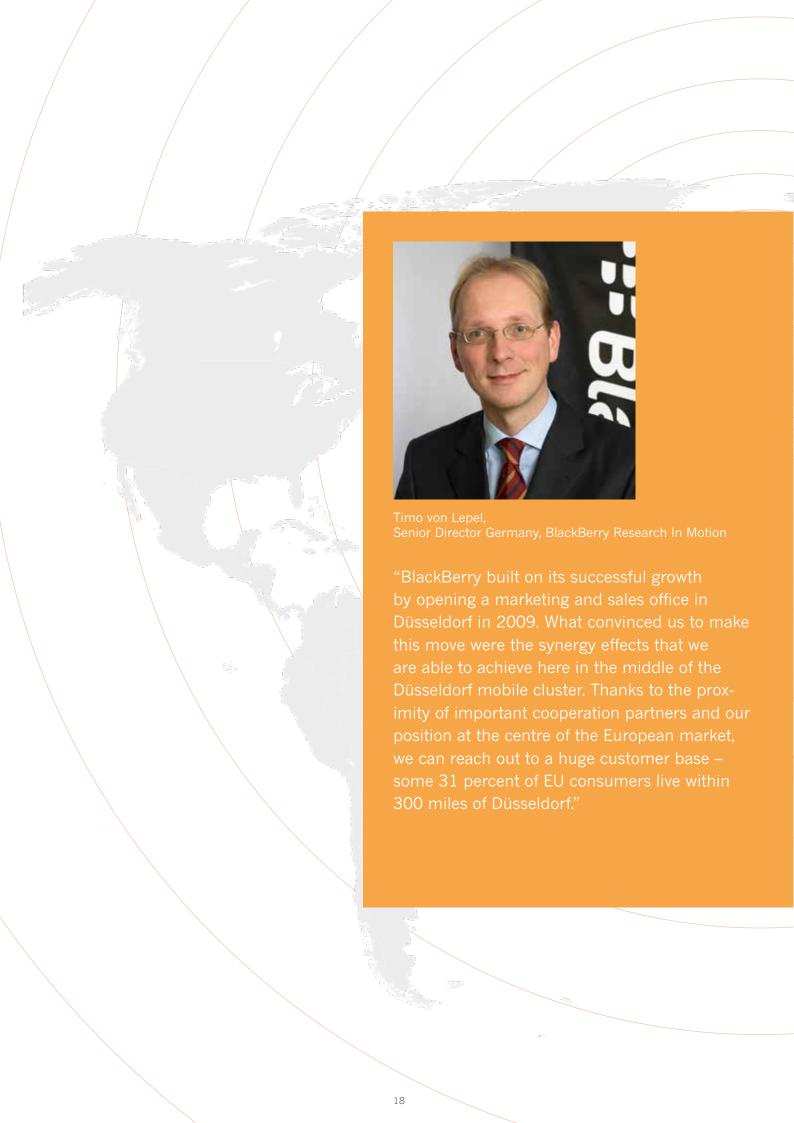
"With about 1,500 companies from the ICT sector based in the city, Düsseldorf offers an innovative business environment that is unparalleled in Germany. The E-Plus Group – a simyo associate and mainspring of the German mobile communications market – is here, as are top business and media partners as well as a pool of highly skilled employees. A combination that's got the lot, and has helped simyo a great deal to become the world's biggest no-frills, Internet-based mobile services provider.

Düsseldorf. Because simple is just easy."



Service providers, MVNOs, branded resellers

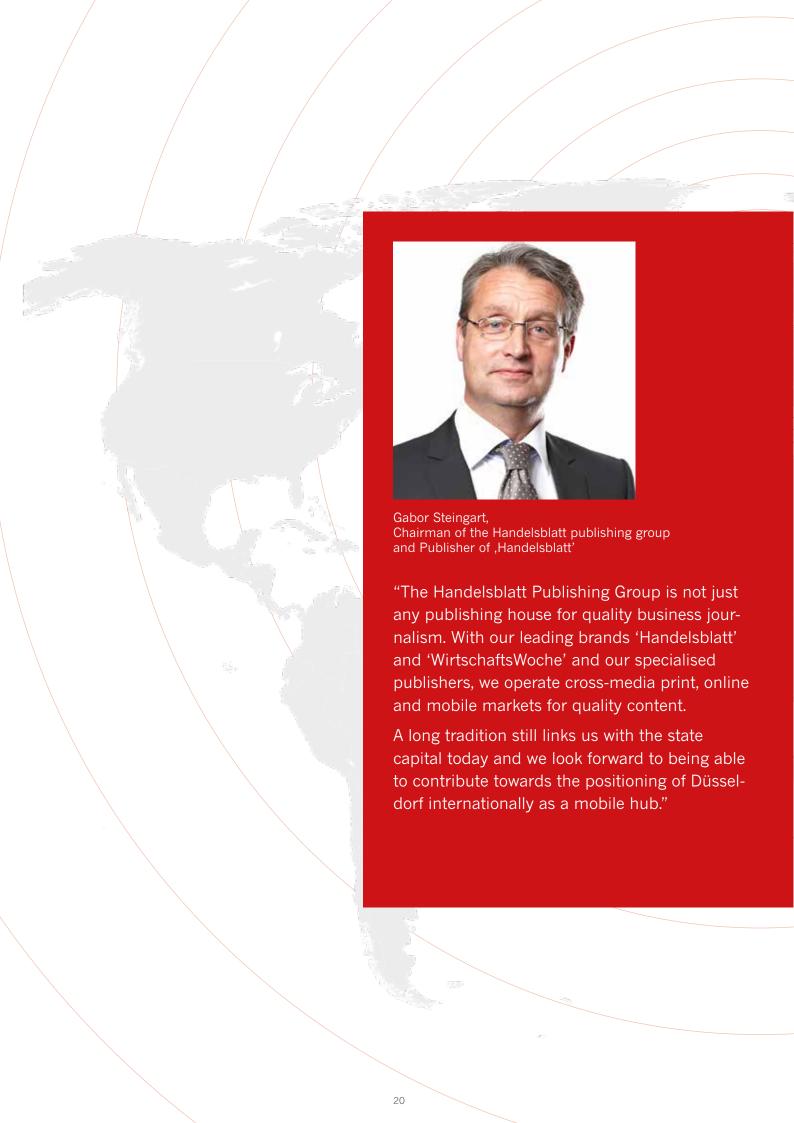
Selected Düsseldorf companies:
 AY YILDIZ Communications, ecotel, freenet,
 Ortel Mobile, ring Mobilfunk, simyo





Mobile devices

Selected Düsseldorf companies:
 BlackBerry, Hewlett-Packard,
 Intermec Technologies, novero,
 Sony Mobile Communications, Tiptel.com
 Toshiba Furone





Content providers

06

Selected Düsseldorf companies:
 BAMM.tv, RP Digital, Schwann Verlag, Ubisoft,
 Verlagsgruppe Handelsblatt





Value added services, mobile apps and solutions

Selected Düsseldorf companies:
 @one IT, AppCom Interactive, Appseleration,
 Babiel e-Information, Bosbec Communication, Cliq
 Digital, Coachme, Code One, Cumulocity, DOCOMO
 Deutschland, dreieque, ECHTZEIT ZEITMANAGEMENT,
 Hot Chili Apps, Inmote, Jommi Online Marketing, Kaasa solution, Live Reply, MEDISANA, mischel & söhne communication, net mobile, Nokia, PiXanta, Protegon,
 RHEINFABRIK, Secusmart, SES RFID Solutions, SHL
 Telemedizin, sipgate, Sogeti, Slenderiser, Sybase, Vela



André Schieck Chief Digital Officer GREY Germany

"Düsseldorf can boast the biggest advertising turnover of any city in Germany. And GREY Worldwide is a major contributor – not least thanks to its strongly growing digital business. In the domain of digital culture, clients are looking for those innovative concepts and mobile solutions that can be actively accessed by users, solutions that help us secure the sales success of our international clients. Düsseldorf provides the perfect environment for this. We take pride in hosting Mobile Monday, a developer forum for outstanding creatives who come together in GREY's Embassy of Ideas."



Mobile marketing, mobile advertising, mobile media

80

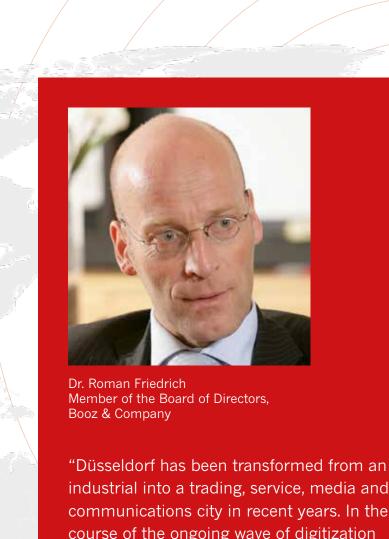
Selected Düsseldorf companies: apprupt, bam! interactive marketing, BBDO, Euroweb, Gettings, GREY Worldwide, GroupM, Düsseldorf Airport DUS, MATERNA newmedia, MediaCom, madvertise media, OMNICOM Media Group Germany, TWT Interactive, Velti, VivaKi





Trade, services, M-commerce

Selected Düsseldorf companies:
 ElectronicPartner, Emmas Enkel,
 Hierbeidir.com, METRO GROUP, Mitsui, re:Store



"Düsseldorf has been transformed from an industrial into a trading, service, media and communications city in recent years. In the course of the ongoing wave of digitization the importance of information technology in companies has fundamentally changed. That is why internationally leading institutes of technology have confidence in Booz & Company. Our work focuses on one clear aim: to generate added value and thus new strength for sustainable solutions."



Consulting

10

Selected Düsseldorf companies: 1stMOVER, 7P Solutions & Consulting, AcademicIT, A.T. Kearney, Booz & Company, effmertconsult, listérus & partners, McKinsey & Company, MediaanABS Deutschland, Mobile Marketers, MSERVICES, Shark Holding, Valuedfriends, P3 communications, PricewaterhouseCoopers, troido android consulting





Trade associations, institutions, disseminators

11

Selected Düsseldorf organisations:

BVDW-Fachgruppe Mobile, Deutscher

Marketing-Verband, Digitale Stadt Düsseldorf,

Digital Markets, K-LAN, Landesanstalt für Medier

Nordrhein-Westfalen (LfM), Messe Düsseldorf,

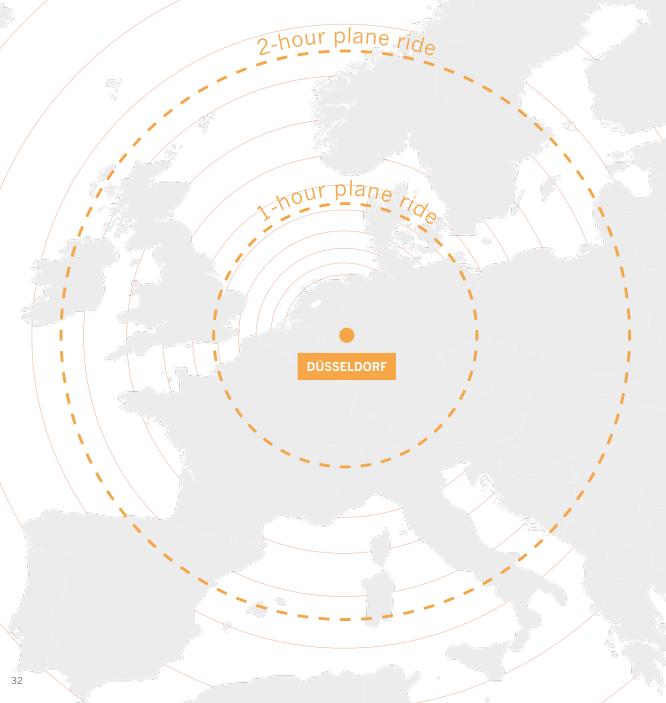
Mobile Marketing Association, MobileMonday

Düsseldorf, Open Device Lab Düsseldorf,

Rheinbahn, Vodafone Enterprise Planum.

COME CLOSER

Düsseldorf is the capital city of North Rhine-Westphalia, the most densely populated state in the Federal Republic of Germany. Düsseldorf lies at the heart of the Rhine-Ruhr Region which is home to 11.6 million people and some 500,000 companies – all within one hour's drive. 155 million people live within a radius of 300 miles. That's around 31% of the entire population of the European Union and also 50% of its purchasing power.





THE RHINE-RUHR REGION, WITH DÜSSELDORF AT ITS CENTRE, IS GERMANY'S MOST POWERFUL ECONOMIC REGION.

Düsseldorf/Rhein-Ruhr

Inhabitants 11.6 million Employees 5.7 million

For comparison:

Frankfurt		Berlin	
Inhabitants	5.5 million	Inhabitants	6.0 million
Employees	2.9 million	Employees	2.7 million
Stuttgart		Munich	
Inhabitants	5.3 million	Inhabitants	5.5 million
Employees	2.7 million	Employees	3.0 million
Hamburg			
Inhabitants	5.1 million		
Employees	2.5 million		

In an international comparison:



DÜSSELDORF/ RHEIN-RUHR

sqmi 4,532 Inhabitants 11.6 millior 37 miles



PARIS - ÎLE-DE-FRANCE

sqmi 4,633 Inhabitants 11.7 million 43 miles



GREATER LONDON

sqmi 5,478 Inhabitants 13.6 million 56 miles



NEW YORK

sqmi 2,363 nhabitants 14.0 million 43 miles

MESSE DÜSSELDORF

- One of Germany's most important expo centres that attracts up to 2 million visitors and over 30,000 exhibitors annually
- Over 50 trade fairs, of which 24 industryleading events
- www.messe-duesseldorf.de

DÜSSELDORF CONGRESS

- Ten locations for conventions and business events, offering customised space concepts for every type of use
- Where mobile communications players meet for future-focused conventions, company events and seminars
- www.duesseldorfcongress.de
- www.convention-duesseldorf.de

SEAMLESS INFRASTRUCTURE FOR GLOBAL OPERATIONS

- International school and other training facilities for children from abroad
- 40 consulates and almost as many foreign development organisations
- Düsseldorf Airport DUS is Germany's third-largest airport, more than 180 destinations worldwide
- Düsseldorf lies in the densest motorway network in Europe
- · Düsseldorf is Germany's third-largest inland port



DÜSSELDORF, "TEN MINUTE CITY"

Having a major airport so close to the city centre is a unique feature in Germany: from Düsseldorf International, it takes only ten minutes to drive to the city. The expo centre is only a few minutes away from the airport and can be reached in ten minutes from the city.

MOBILE LIFE DUSSELDORF

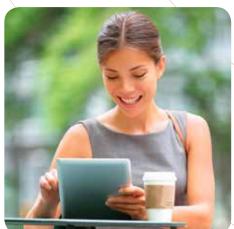
Düsseldorf's hallmarks are its excellent locational benefits, high quality of living and moderate rents and cost of living. In quality of living ratings, Düsseldorf was ranked sixth in global comparison and the top city in Germany. Its mix of international corporations and small niche industries, fashionable Königsallee and traditional Old Town, business and lifestyle are what give it its charm. Düsseldorf's cultural offering can easily match other big cities in the world. But despite its bustling city life, it has not become an urban jungle. While offering art and cultural events many larger cities might envy, it has remained that rare thing – an exciting, yet relaxed cosmopolitan centre.



















Digital City Düsseldorf - The networking group for the information and communications sector

The association, which has been joined by a number of major companies from the Düsseldorf area, has become an important instrument for regional economic development. The aim of the Digital City Düsseldorf is to promote networking and an active exchange of information and experience. The Digital City Düsseldorf

- is a platform for business, communication and networking
- organises monthly sector meetings, events and functions
- is the direct route to decision makers and service providers
- offers its members access to the expertise of the community

For further information, see: www.digitalestadtduesseldorf.de Direct contact: Tel.: +49 211 89-9 72 31, E-mail: digitalestadt@duesseldorf.de

HIGHLY SKILLED

Skilled and well-trained human resources are a substantial attractor for any company in the mobile sector, and a domain in which Düsseldorf excels. North Rhine-Westphalia is home to 58 universities and universities of applied sciences – the greatest concentration of higher education institutions in Europe.

More than 500,000 young people train at universities located within a 50-mile radius. The Düsseldorf region is especially versatile in offering an exceptional range of educational and training opportunities. Every year, thousands of graduates in NRW take their exams in university courses that prepare for a career in modern communication technologies. With 626 out of every 1,000 residents in the workforce, Düsseldorf can also boast Germany's second-highest employment density. Düsseldorf offers an international standard of education, training linguistically competent specialists for all European and non-European countries. Intercultural competence and language skills are key success levers for international operations.

VOCATIONAL TRAINING

Germany's Dual System of vocational training has set standards worldwide. The region's chambers of industry and commerce examine hundreds of candidates every year in ICT-related professions (selection):

- Telecommunication
- Information services
- Software engineering for
 - Application development
 - System integration
- Information and telecommunications system electronics

DÜSSELDORF UNIVERSITY AND UNIVERSITY OF APPLIED SCIENCES

- · Heinrich Heine University, offering:
 - Computer sciences, including 12 work groups for information technology on: algorithms, data structures, operating systems, image and signal processing, geoinformatics, cryptology, mobile and distributed networks, software technology and programming languages
 - Communication and media science
- Düsseldorf University of Applied Sciences, offering courses in electrotechnology, microsystems technology, logistics, media and design

REGIONAL RESEARCH INSTITUTES

- Fraunhofer Institutes for
 - Software and Systems Engineering
 - Microelectronic Circuits and Systems
 - Laser Technology (ILT)
- Institute for Mobile and Satellite Technologies (IMST)
- Ultra High-Speed Mobile Information and Communication (UMIC) Research Cluster
- Max Planck Institute for Mathematics
- Association of German Engineers VDI

FOR INVESTORS

Dependable political majorities and a political climate favouring businesses and entrepreneurship make Düsseldorf a prime target for investors. At 440 points, business tax in Düsseldorf is extremely low compared with other major German cities (Frankfurt: 460, Munich: 490). The city has been free of debt since 2007 and has had a balanced budget for many years. Taxes have been lowered eleven times to reduce the burden on companies. And family-friendly Düsseldorf creates a welcoming atmosphere for their employees, with free kindergartens, extensive green areas and recreation sites, and a broad palette of art and cultural events. The Office of Economic Development is the city's 'one stop agency' for expert advice on property rental and residence/work permits, help with local authorities and access to country or industry-specific business networks.

FOR START-UPS

Collaborating with more than 20 industry and public partners, the Düsseldorf Office of Economic Development heads a regional Startup Network focused on expert advice and business coaching. The Office provides newcomers with valuable support in implementing their business model and building up their enterprise. Start-ups and young companies are allowed access to the Office's own business networks. It also offers a real estate service and advisory service to help identify and contact relevant public authorities. Designed as a 'one-stop agency', the Office of Economic Development is the central point of contact for all queries and concerns in every phase of business development.

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Experience the prospectus



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