

01	02	03	04	05	06
Enter	Develop	Install	Open	Avoid crash	Update
011 <i>Enter Smart Cities</i>	019 <i>Global challenges—cities get smarter</i>	069 <i>Converting ideas into reality—grand visions and manageable work packages</i>	129 <i>Everyday life—new possibilities and new limitations</i>	189 <i>Avoiding crash—dealing with concerns</i>	227 <i>Taking chances—learning from experience</i>
	021 <i>Unclear concept—smart what?</i>	070 <i>The city of Friedrichshafen—a small city at Lake Constance</i>	131 <i>Urban society—the interplay of urbanity and virtuality</i>	190 <i>Project partners—differing objectives and cultures</i>	228 <i>In a nutshell—summary</i>
	025 <i>Various fields of action—a cross-section of smart spheres</i>	075 <i>Deutsche Telekom—a large global corporation</i>	133 <i>Information and communication—what’s new?</i>	193 <i>About trust in the system and concerns—are the technologies harmless?</i>	232 <i>Finding balance—considering the local context and adapting to the world</i>
	027 <i>Practical approaches—projects and rankings</i>	077 <i>Broadband infrastructure—landlines and mobile communications</i>	136 <i>The Digital Divide—gaps are opening up</i>	195 <i>Mobile communications and WLAN—“They are bringing radiation directly into the home …”</i>	233 <i>Visions and individual projects—both are needed</i>
	032 <i>Spatial context—integration and new building</i>	080 <i>Public Private Partnership—the basic rules of cooperation</i>	144 <i>Always on—global on location</i>	197 <i>Data protection—“Where did they get my address?”</i>	235 <i>Innovations through PPP—using what is familiar and making changes possible</i>
	036 <i>Participants—the state, cities, and businesses</i>	084 <i>Projects in practice—solutions for everyday life</i>	154 <i>Networking—the invisible city</i>	202 <i>Data security—“Oops! Your data could not be uploaded”</i>	240 <i>Focusing on concrete applications—necessary for fostering enthusiasm</i>
	039 <i>A new start—Germany goes smart</i>	096 <i>Complexity—the limits of controllability</i>	156 <i>T-City—what does it have in store for us?</i>	204 <i>Attitudes towards information and communication technology—taking concerns seriously</i>	242 <i>In conclusion</i>
	041 <i>Smart City in practice—T-City Friedrichshafen</i>	098 <i>Idiosyncrasies—unique features of Friedrichshafen</i>	158 <i>Participation—a difficult process</i>		
		103 <i>Heterogeneity and dynamics—challenges for Deutsche Telekom</i>	163 <i>Advantages and usefulness—a matter of perspective</i>		
		105 <i>Public relations—do good and talk about it</i>			

Appendix

244 Authors Glossary Literature Picture credits Acknowledgements Imprint

[A]

[B]

[C]

[D]

Contributing authors

053

Citizens become pioneers
René Obermann

055

“Compact Innovation”
in one of Germany’s
strongest economic regions
Andreas Brand

058

Infrastructures get smart
Franz-Reinhard Habbel

060

Information and communication
technology and the
accelerated pace of life
Dietrich Henckel

062

How does the new come
into being?
*Matthias Wefer,
Jens-Rainer Jänig*

113

T-City review—the roles of
citizens and businesses
Josef Büchelmeier

116

The challenge of project
management—why
communication is so important
Jörg Bollow

118

T-City—success and failure
Jürgen Kaack

121

T-City Futurists sum up
their experiences
Hans-Joachim Bachmann

124

The transformation of
public places through the
technical enhancement of
sensory perceptions
Rainer Kazig

173

Innovation project
T-City Friedrichshafen
four questions—four answers
Ferdinand Tempel

177

“Bottom up dynamics”—
a contribution to the energy
transition
Stefan Söchtig

180

Smart Meters—
a new contribution to
saving electricity
Sebastian Gölz

182

“Independent Living”—
a T-City residential project
Jaqueline Egger-Buck

184

Social GeoWeb—
participatory planning
using digital maps
Stefan Höffken

207

A long step-by-step process
Stephan Althoff

210

E-government in Germany:
progress, naivety, and déjà vus
Tino Schuppan

213

Electronic participation—
a new participation channel
Oliver Märker

216

Social media—driver of the
mediatization of society
Caja Thimm

218

Interpersonal skills in relation
to local competitiveness
Stephan A. Jansen

222

Urbanity 2.0—about the
development of the urban in
the age of increasing virtuality
Stefan Schmitz



011

Enter Smart Cities

“I can’t understand why people are frightened of new ideas. I’m frightened of the old ones.”

John Cage, composer

Smart City, Smart Spaces, Smart World—the concept of “smart” has become an integral part of the current debate about the future of our cities. However, what does the term “Smart City,” which is used so frequently, actually mean? Is it a marketing label? An academic concept? Or just an empty word? Can this so-called Smart City be an answer to the current and future challenges and problems faced by our cities? And what does all this have to do with a small city near Lake Constance?

Our book deals with these questions and attempts to provide some answers. Despite all the vagueness and lack of precision surrounding the term “Smart City,” all approaches agree that the new information and communication technologies (ICT) play a key role in the area of future urban development. Nowadays, the new media have pervaded most areas of everyday life almost all over the world, influencing communal life in our cities. The ways in which we communicate with each other and how we deal with the vast array of ubiquitously accessible information have changed significantly. It is not just owing to the “hardware”—in other words the new devices, PCs and notebooks, simple cell phones and high-performance smartphones, or the high-speed landline and mobile connections—the use of which most of us now take for granted and which have spread and advanced so rapidly in recent years.

The use of new information and communication technology (ICT) in Smart Cities is more about the multitude of applications and solutions that apply these new technologies and make use of the Internet in many different ways. There are various fields in which the new applications are meant to improve everyday life in the cities. These areas are often denoted with a combination of the letter “E” for “electronic” followed by the English word for the respective area in which improvements are sought. Therefore, the area of E-government is about the streamlining and reorganization of administrative processes, E-health is concerned with the possibilities of telemedicine and telemonitoring, E-mobility deals with measures that optimize traffic systems, E-learning is about using digital media for teaching and learning, and E-energy deals with the digital networking and optimization of the energy supply system—to name just five areas where modern information and communication technology is being implemented.

The layout of this book is based on the use of the new ICT, which has accompanied us since the mass spread of computers at the end of the nineteen-eighties. Still today, the computer programs and software that are developed have to be installed before they can be opened and used. Even on the newest smartphones, apps still have to be installed and the risk of the device crashing remains.

Smart Cities and the new information and communication technologies go hand in hand.

All aspects of social life are affected.

The layout of the book

02

Develop

019

***Global challenges—
cities get smarter***

021

***Unclear concept—
smart what?***

025

***Various fields of action—
a cross-section of smart spheres***

027

***Practical approaches—
projects and rankings***

032

***Spatial context—
integration and new building***

036

***Participants—the state,
cities, and businesses***

039

***A new start—
Germany goes smart***

041

***Smart City in practice—
T-City Friedrichshafen***

Smart Cities are currently widely talked about, mostly without a clear notion of what the concept means. Therefore, this chapter first defines the terminology and then presents examples from around the world, in which cities are attempting to master the current social challenges using new information and communication technologies. Various points of view, approaches, and models regarding Smart Cities are presented. It becomes clear that many of these are still just visions. The chapter ends with the presentation of a city contest, in which Deutsche Telekom had invited more than 400 cities and municipalities to take part. The city of Friedrichshafen emerged as the winner, thereby becoming the T-City. To gain a perspective on this contest, other city contests are portrayed in this chapter, in which equally large private sector enterprises took on the idea of a Smart City.



019

Global challenges— cities get smarter

*“The nineteenth century was a century of empires.
The twentieth century was a century of nation states.
The twenty-first century will be a century of cities.”*

Wellington E. Webb, former mayor of the city of Denver

Population growth, urbanization, climate change—cities around the world are faced with complex social and ecological challenges. On October 31, 2011, the world population reached seven billion people for the first time and 2.6 people are added to that figure every second (World Population Foundation 2012).

However, it is not only the number of people living in the world that is rising, the number of cities is also rapidly increasing. It is expected that in the next forty years the number of people living in cities will increase by 2.9 billion and that by the year 2050 as much as 69 percent of the world’s population will live in cities. This means that existing cities will continue to expand and that, especially in developing and emerging countries, hundreds of new cities have to be built and enlarged in order to accommodate the growth and migration trends of the world’s population (United Nations 2010, UNFPA 2011).

As can be observed all over the world, the long-term urbanization trends lead to changes that present new challenges for cities. In Bangkok, for example, the overburdened transport systems costs as much as 6 percent of the gross domestic product, and in the Rhine-Ruhr area in Germany, commuters have to face daily traffic jams of up to 100 or 200 kilometers. In 2011, the number of new vehicle registrations permitted in Beijing was restricted to 240,000 to prevent a complete traffic collapse in the city. In Tokyo, the subway system has reached the limits of its capacity with nearly three billion passengers per year. Transport infrastructure problems are thus a feature of cities right around the globe. Other municipal infrastructure systems are also affected by the enormous strain and are often overburdened. In Spain, for example, waste generation increased by 39 percent per capita over ten years. In London, a third of the drinking water is lost because of old and leaking water pipes (Vaggione 2011; Acatech 2011; Just/Thater 2008).

Therefore, cities urgently need more efficient infrastructure systems to reduce traffic congestion and noise, air, and water pollution. However, it is not only the various infrastructure systems that are in need of new solutions. The growing concern about the consequences of global climate change has also made aspects of energy consumption and CO2 emissions important fields of action. Furthermore, the consequences of demographic development, such as an ageing population, present an additional challenge for cities.

Demands on cities in the
twenty-first century

In 1900, just 10 percent of the
world’s population lived in cities.

Further insights into twenty-first century cities,
their problems, and challenges: Burdett/Sudjic
(2011), UN (2011) and Sieman (2007)

Infrastructure

However, in the debate about Smart Cities it is not always the city and its various spheres of life that form the center of attention. For example, the two German language studies SMART2020 Addendum Deutschland: Die IKT-Industrie als treibende Kraft auf dem Weg zu nachhaltigem Klimaschutz (SMART2020 Addendum Germany: the ICT industry as the driving force behind sustainable climate protection) and Smart Cities—Grüne IKT zur Zukunftssicherung unserer Städte (Smart Cities—Green ICT to safeguard the future of our cities) adopt a rather different point of view. While both studies also discuss how to structure the cities of the future more efficiently, the focus is on climate protection. The first study, published by Boston Consulting Group, shows which technologies can be used to reduce emissions and the focus is on the companies that provide these technologies. A range of business models—e.g., in the areas of Smart Logistics and Smart Buildings—are identified and evaluated. The latter study, published by Bitkom, is dedicated to the possibilities that are opened up through the use of ICT in relation to climate protection and resource efficiency. The various possible uses are summarized under the heading “SMART Life” (BCG 2009; Bitkom 2011).

The various definitions and the subdivision of fields of action delineate topic areas, but do not fully explain the concepts. Even after deciding on a concrete definition, the concept of Smart City remains superficial and elusive among the wider public and can cause friction. Therefore, one must always probe further as to what associations are being made with the concept of Smart City.



smart2020.cityandict.de



greenict.cityandict.de

027

**Practical approaches—
projects and rankings**

It is a fact that an increasing number of Smart Cities are sprouting up all over the world. However, their visions and the corresponding objectives vary widely. In Kochi, India, for example, a newly built IT Park is labeled as a Smart City, and Smart Village Cairo is a business park and technology cluster in the suburbs of Cairo. In Santander, Spain, the term Smart City denotes a project for researching the urban network using sensors. The aim of the Portuguese project PlanIT Valley is to build an intelligent research city. The Amsterdam Smart City initiative, on the other hand, emphasizes the significance of cooperation between residents, authorities, and enterprises, with its projects focusing primarily on aspects of energy efficiency and climate protection. In Edinburgh and Southampton the focus is especially on activities in the area of E-government.

This is just a small selection of the self-proclaimed Smart Cities in the world, but it shows the wide range of interpretations and enables a differentiated perspective on the project content. These examples use the term primarily in conjunction with notions of economic prosperity and employment potential, with visions of a city that benefits from “intelligent” industry—i.e., especially from companies in the ICT sector. In practice, it is often about commercial zones or business parks. The project in Santander, Spain is a rather different type of technology park, as a whole city has been made into a research laboratory. As with the U-Cities in South Korea, the focus is on sensors and interconnection. However, the sensors are intended not only to research the urban network, but also to improve the quality of life in the process.

Examples:
India
Egypt
Spain
Portugal
Netherlands
Great Britain



smartsantander.cityandict.de



036

Participants—the state, cities, and businesses

Complex projects such as Smart Cities demand the integration of a wide range of participants, in different constellations and related to each other in different ways. On the one hand, the projects are integrated into national or municipal development schemes; on the other hand, they are initiated by companies and executed in the form of Public-Private Partnerships. One can often see the emergence of hybrids and of overlapping. It is noticeable that in Asian countries, the state has so far played a greater role in the development of ICT and the driving of Smart City initiatives than in the Western world. Particularly in Europe and in America, one is under the impression that projects are initiated more often by the private sector. However, in Portugal this is now changing: the PlanIT Valley project was declared a “project of national interest” and receives strong support from the local administration in Paredes as well as from the national government (Rooney 2011).

In connection with this, the activities of the EU are gaining in significance. “EU 2020” designates the growth strategy of the European Union and stipulates an intelligent, sustainable, and integrative European economy. The use of ICT forms part of the agenda, as do the development of new, environmentally friendly technologies and of efficient and intelligent power grids (European Commission 2012a).

To drive their endeavors forward with regard to this, the European Commission launched the “European Initiative on Smart Cities” to sponsor cities and regions seeking to reduce their greenhouse gas emissions through the sustainable generation and use of power. Furthermore, the sponsorship scheme “Smart Cities and Communities” was introduced in 2011: 80 million euros were made available for funding integrated, innovative, and energy-efficient solutions that contribute to the reduction of CO2 emissions. The sponsorship scheme is part of the Strategic Energy Technology Plan (SET) of the EU (European Commission 2012b; Energy Agency NRW 2011).

The politically initiated schemes are limited to a few specific fields of action, as are the various municipal projects. The environment and energy are among the fields receiving the most attention.

It can only function if we work together

The various Smart City projects show that they can’t be managed by a single party. Smart Cities are very complex because they always involve several fields of action, and as a result demand a range of skills in terms of planning and execution. The solutions also require differing types of regulatory measures. Furthermore, the investment risks are often very high, so that it makes sense for several economic sectors to cooperate. Hence, the successful creation of a Smart City seems virtually impossible without a Public-Private Partnership, in whatever organizational form.

Private and public sector partners

024

New Songdo, presented in this chapter, is an example of a state-run project

EU 2020: the growth strategy of the EU



setis.cityandict.de

Complex challenges require cooperation.

A Public-Private Partnership is the result of a cooperation between public and private sector partners, in some cases agreeing to a common organizational platform and setting out a timescale for the attainment of concrete objectives. The more the partners involved cooperate on an equal footing, the more it can be considered a true partnership. Especially in complex projects, whose development is not clearly foreseeable, a close cooperation of this kind can prove essential. In addition, it is helpful if the various parties can work towards complementary results. This can apply, for example, to investment capital on the one hand, and the ability to regulate on the other. It is an advantage if the parties complement each other within their cooperation and do not compete against each other.

However, in projects involving Smart Cities, there are frequently different parameters than in classical PPPs. The roles of the partners are defined differently from those in construction projects. Instead of hierarchical solutions, network-orientated moderation processes are required. The task of developing a new “operating system” for an urban community is naturally more complex than planning, building, and managing a road or a new building. When it involves the whole urban society, it is not so much about the planning and funding of individual products that are clearly defined from the outset. Instead, it has more to do with the creation of an open and innovation-friendly atmosphere during the course of the development and “building” of the Smart City, which is conducive to generating ideas for dealing with information differently and enabling a different level of interaction between the partners.

Smart advertising and big money

The private sector plays an important role in Smart City projects. It is not only a partner in Public-Private Partnerships, it is also one of the essential driving forces behind projects, alongside the cities and public sector initiators. The private sector is very interested in realizing such projects and their motives are fairly mundane. Apart from widening their business interests, companies are also keen to boost their image by being publicly concerned about the future of the cities.

There is a wide range of companies involved in this. A common feature, however, is that each has their very own vision of a Smart City. This is hardly surprising, as their primary objective is to sell products and solutions to their potential customers. The titles of their visions sound impressive: Smarter Planet (IBM), Smart + Connected Communities (Cisco), Sustainable Cities (Siemens), Smart Cities (Orange und Oracle), City 2.0 (Hewlett Packard), Next-Generation Smart Cities (Hitachi). The list goes on. Apart from the aforementioned technology enterprises, companies representing other sectors are also involved, such as architecture and management consultancy (e.g., Accenture, Buro Happold, Arup).

Special features of Smart City PPPs

Private interests: turnover and image



The T-City contest was carried out as a two-tier qualitative selection process. Out of the fifty-two applications received, the jury of ten—comprised of representatives from different social spheres and from Deutsche Telekom—initially selected ten cities, whose applications corresponded most closely to the objectives, criteria and core themes of the contest. The selection of the finalists was a majority decision by the jury, based on the accompanying scientific research and the evaluation tool that had been developed.

In the second phase of the contest, the cities and municipalities were given the opportunity to substantiate the projects and to develop suggestions regarding the organization and implementation procedures. As several of the cities had not really involved their residents, businesses, and other civil society organizations in the first phase, it was a key requirement of the second phase to strengthen information and participation channels and to document these. Suggestions for the further support of their application documents were sent to the cities by a project group within Deutsche Telekom and the consultant social scientists, who visited all the cities at the end of 2006 and spent a day discussing the strengths and weaknesses of the application with the organizers in the respective municipalities.

In a concluding jury meeting in February 2007 the city of Friedrichshafen was declared the winner following a secret ballot, on the basis of the social-scientific evaluation. In order to recognize the efforts of the unsuccessful cities and to mitigate their disappointment over not winning, Deutsche Telekom awarded all second-round contestants 50,000 euros with which to implement their project ideas. Furthermore, the city of Arnsberg received a special award for the best social project with “E-childcare,” for networking their childcare facilities.

**Working towards the future—
the vision of Deutsche Telekom**

The corporation itself considered T-City to be a trial for the future regarding innovative, customer-oriented, and user-friendly product developments and services, which an entire urban society was invited to participate in. The corresponding development of new marketable products was also intended to contribute to safeguarding the future of the corporation, as stated in the application documents. With T-City, and by involving user groups from the outset, Deutsche Telekom wanted to try out a new form of demand-oriented innovation management, which goes beyond the supply-oriented approach of the development and market launch of new technologies.

A two-tier selection process
by an independent jury



arnsberg.cityandict.de

“We do not consider T-City as a sponsorship or goodwill scheme and especially not as a marketing initiative. No, T-City is a public trial for the future, a flagship project with a particular appeal.”

René Obermann during the award presentation of the T-City contest

Information and communication technology and the accelerated pace of life

by Dietrich Henckel, Professor for Urban and Regional Economics at the Institute for Urban and Regional Planning at the TU Berlin



Even though it was already anticipated at the end of the nineteen-seventies and beginning of the nineteen-eighties that information and communication technology (ICT) would have a big impact, the effects of the “new media” are much more far-reaching than was initially expected. This is especially owing to the rapid diffusion and tremendously fast development of technologies and their corresponding services, which open up new possibilities that were previously unforeseen, such as mobile communications and the spread of computing.

In the meantime, it has become evident that ICT has contributed massively to increasing the pace of many areas of life, even if in some cases this is not immediately obvious. To name just a few examples:

- With the immediate access to information everywhere and one’s ubiquitous availability, expectations regarding response times have changed significantly—as a rule an immediate reply is expected. There is no longer the time lapse that was the case with letter post. It is only recently that counter movements have been developing—such as email-free days or switching off devices.
- As a result of this, ways of working have also changed: the boundaries between different tasks are dissolving, the number of concurrent ongoing tasks (actually arranged or as an expectation) is increasing, which can lead to being on permanent latent on-call duty. The currently fashionable burn-out syndrome can also partly be seen as a consequence of this development.



- With these technologies and services, additional information becomes available that can and must be processed. The multitude of new applications (e.g., apps), which are often useful, demand one’s attention and decision-making. How a greater number of options can lead to a lack of time was portrayed in the nineteen-seventies by Staffan Linder in his book, *The Harried Leisure Class* (1970).

The available technology is a precondition for the increase in the pace of life, but not the only catalyst or cause, instead it is embedded in a multitude of interdependent determining factors. As a rule, technology is created in the course of social changes to offer a solution to social problems (Beniger 1986). Amongst these social changes, for example, are the internationalization and globalization of economic relations, which are connected to and are carried out with a high degree of deregulation and flexibility, as well as increased competition.

The far-reaching changes in daily life and in working life are coupled with a significant impact on the spatial configuration of the economy and society, on the pattern of expectations, and the perception of space. It is to be expected that the accelerating effects gain momentum, so that attempts to slow them down are pretty much in vain. Thus, the increase in the pace of life continues to be one of the dominant trends of our society (Rosa 2005).

How does the new come into being?

by Matthias Wefer, independent communications and strategies consultant,
and Jens-Rainer Jänig, executive partner of the brand agency and
PR consultancy mc-quadrat, Berlin; External consultants for the T-City project

*“Everything that is complete and perfect is admired;
evolving is underestimated.”*

Friedrich Nietzsche

Do good and talk about it. This public relations catchphrase was taken literally by Deutsche Telekom AG in 2006. The company wanted to demonstrate what it is achieving in society as Germany’s largest telecommunications provider, by showcasing it in one location. After all, information and communication technology (ICT) is shaping our future more than any other technology. However, contrary to many “show-cases,” taking long-term action was to precede all talk.

The focus was not on a quick image boost, but on achieving recognition. From today’s perspective, the decision-makers at Telekom proved to be just as visionary as they were daring. With a Public-Private Partnership (PPP) on this scale, they were entering completely new and uncharted territory. Never before had an entire urban society been called upon to participate on so many levels, never before had there been such a large budget for joint projects (albeit not as cash funds, but generally as non-cash benefits and personal development incentives, in return for which the urban partners were at least expected to contribute commitment and good ideas).

The contest between the applying cities proved to be a significant challenge in itself, with regard to communication, management of expectations, and evaluation of the applications. When Friedrichshafen was proclaimed as the winning city, the number of participants, ideas, expectations, and goals increased again dynamically. The city had to become networked with itself (some of the organizers had never sat at the same table before), the city with the Telekom corporation (two alien galaxies), and even the corporation with itself (“If only Telekom knew what Telekom knows”).



And what about Friedrichshafen? There was considerable skepticism in particular among the elected city representatives (and to a certain extent there still is up until today): What do they want from us? Is it a publicity gimmick, a Greek gift, infiltrating an entire city with a magenta Trojan horse?

Perhaps the potential gains were too great, the opportunities presented by the project too remote, and the demands it placed too unusual to be gauged accurately from the outset. In particular, the lack of a fixed overall plan and the way each subsequent step was determined individually by the city’s organizers while the project was already in full flow, presented the sort of unusual freedom that is sometimes more inhibiting than motivating.

And how about the citizens, who ought to benefit the most from the advantages of modern ICT? First of all they were cautious. This is understandable, considering that the projects often seemed abstract until they were implemented into daily practices, and that not all technical innovations are met with universal enthusiasm.

However, hadn’t the city just applied successfully for the well-remunerated title of T-City? Indeed it had. And hadn’t the city been the first to be equipped with the most modern high-speed wireless and landline infrastructure, alongside large cities such as Hamburg, Frankfurt, or Berlin? Indeed it had. However, few had expected the victory, or the consequence that particularly in a PPP there have to be both give and take. For T-City was by no means a bountiful sponsoring project, but an opportunity offered to a city to develop cooperative new ICT solutions or to adapt existing ones, intended to increase the quality of life for residents.



069

Converting ideas into reality— grand visions and manageable work packages

*“The implementation of these systems is not so straightforward,
and can only be achieved through ‘smarter governance.’”*

Zoe Green, Royal Town Planning Institute (RTPI), London



globalurbanist.cityandict.de

When the development of a Smart City project idea has been completed, the efforts to implement it on-site begin. Grand visions have to be divided into smaller, manageable areas that require further development. Partners have to be sought and found, work packages set out and executed. Objectives and the intended procedures have to be agreed on and communicated.

The cooperation presented in this chapter between the telecommunications corporation Deutsche Telekom and the city of Friedrichshafen has a very distinctive configuration. A large telecommunications company and a mid-sized city are fundamentally different, and the Smart City project has to be integrated into both spheres in order to ensure overall success. Each of the partners is used to following established and different procedures in their own particular worlds when handling projects. The two partners have differing internal structures and basically pursue different objectives. Deutsche Telekom has to maximize profits for its shareholders; and as a public regional administrative body, the city of Friedrichshafen is duty-bound to public welfare.

These fundamental differences prompt the question of how a cooperation can succeed given these circumstances. What challenges present themselves when integrating the T-City project into the city and the corporation? How can different objectives with regard to a Smart City project be harmonized to benefit both parties? Which organizational structures and procedures enable efficient cooperation between the two partners? How can they develop trust, which is an essential foundation for the project lifespan? How can additional Smart City partners be gained and integrated into the existing structures?

Following a brief presentation of the particular characteristics of the two partners—Deutsche Telekom and the city of Friedrichshafen—this chapter explains how the basis for the infrastructure was created and how the project organization and individual sub-projects were developed and put into practice. The challenges that presented themselves during the implementation and how they were dealt with are also presented, along with the activities designed to promote the public image of the project.

Specifics of the
implementation

What are the challenges?

- 1

In an emergency, water sportsmen can send a **GPS distress signal** by touching their cell phone, to alert the rescue services on duty.
- 2

The **Mobile Clinic** system enables the interactive monitoring of patients with chronic heart conditions. The participants in the project transmit their health data from home to the hospital or doctor in charge. The data is evaluated at a distance. Mobile Clinic contributes to restoring the patients’ personal responsibility and quality of life.
- 3

The **KatCard** E-ticketing project enables the non-cash purchase of tickets for catamarans operating in the Lake Constance region.
- 4

In the **Media Hotel** “Goldenes Rad” (“The Golden Wheel”) in Friedrichshafen, guests can use state-of-the-art multimedia technology. Entertainment and information services can be accessed via a media center. The device can also be used as a digital video recorder and as a work station.
- 5

Edunex is a web-based educational platform for schools in Friedrichshafen.
- 6

The Edunex educational platform is accessed via the biometrically secured **EduKey**.
- 7

Smart Metering provides customers with information about their electricity and gas consumption. Sensors transmit personal consumption data and the results are presented via a web portal. This helps customers to control their consumption. The project helps energy providers to gain insight into potential future energy infrastructures.
- 8

The **digital picture frame** has an integrated wireless module and receives digital photos via the Deutsche Telekom network, displaying them automatically on the screen.
- 9

Short infos on various topics can be requested via the **CityInfo** SMS information service. Businesses, municipalities and associations also provided their own information services.

- 10

The touchscreens of nine **Multimedia Stations** in Friedrichshafen provided information and services free of charge in the areas of city, tourism, events and short-range public transportation.
- 11

The multi media stations in Friedrichshafen give deaf people access to a sign language interpreting service, using special video **telephones for the hearing impaired**. An interpreter translates the conversation spontaneously in both directions.
- 12

SZ News / Schwäbische.de on Entertain adds a local dimension to the IPTV (Internet Protocol Television) information services. The user can choose options according to personal preferences, such as filtering information from different cities in the Lake Constance region, selecting topic areas, and whether they are presented as text, video or photo.
- 13

www.friedrichshafen.info compiles all important information required for a stay in Friedrichshafen. The **Tourism Portal** enables the booking of accommodation and research about events. It also provides leisure time tips.
- 14

With **G/On**, employees can access their work stations securely from anywhere in the world. Users have access only to approved applications. Access to the company network is declined, preventing infiltration by hackers or malware.
- 15

Using **dDesk**, applications and data are stored on the cloud on a central server. Users can access their programs and data from anywhere in the world, without installing them locally.
- 16

The **T-Mobile emergency number** supports the coordination of rescue services in Friedrichshafen. Apart from the analog notification system of the rescue forces, the lifesavers also receive automized calls and SMS messages on their landline and cell phones. The receiver responds by pressing a key, to communicate whether he will arrive at the scene immediately or whether he will be delayed.
- 17

The **City Portal** www.friedrichshafen.de provides official information quickly and clearly. Many municipal services, such as managing appointments and providing forms, are available online.

The illustration shows a so-called “Word Cloud”. The cloud contains key words that are arranged in order of how frequently they are used. This representation analyzes various news items relating to T-City, taken from the Friedrichshafen newspapers *Schwäbische Zeitung* and *Südkurier*. The larger the key word is printed, the more frequently it was mentioned in the newspapers. Therefore this illustration reflects what the local press was most interested in over the course of the project. It shows that it was not individual projects that attracted the attention of the press at Lake Constance, but events such as the visit of the Federal Chancellor Angela Merkel on the occasion of the T-City Day in 2011, or general topics relating to information and communication technology, such as criticism of mobile communications. Certain projects, such as “Independent Living” or the platform “Kindergarten Online”, were mentioned very rarely in the press. As they were hardly reported about at all, it was only very attentive newspaper readers or those who had heard about these projects from other sources who were aware of their content and purpose. On the other hand, the press reported frequently about the development of the broadband network, E-metering and the “Futurists”. It is also interesting to note that the city beach, which T-City gave as a gift to Friedrichshafen for its anniversary in summer 2011, but which was completely unrelated to the new communications technologies, was reported about significantly more often than the T-City project’s objectives of improving Friedrichshafen’s quality of life and locational advantages.





129

**Everyday life—new possibilities
and new limitations**

“Everything’s amazing right now and nobody’s happy.”

Louis C.K.

When the American comedian Louis C.K. touched on the topic of new information and communication technology (ICT) in a talk show in 2009, he mentioned the great possibilities their use opens up. Many of our daily tasks can be dealt with quicker and easier than ever before in human history. The only drawback in all of this is that people are unable to appreciate it: the technological achievements in recent years are taken for granted. We are constantly complaining because we expect too much of the technologies and are then disappointed.

New information and communication technologies are increasingly pervading many areas of our everyday and working lives and we can no longer do without them (Hatzelhoffer et al. 2011a). The technological developments have opened up new ways of communicating and sharing information, which have an effect on time and space (Henckel 2011). At the same time, the use of new technologies has its limitations and can lead to frustration.

As we stroll through town taking not only our phones but also the Internet with us wherever we go, the new generation of cell phones have made it possible for us to be “phoneurs,” rather than Walter Benjamin’s (1982) flaneur.

Web-based map services such as Google Maps, Bing, or Google Street View provide new assistance for orientation and navigation around cities, with portals where we can read or write reviews about specific places. Furthermore, social networks such as Facebook, MySpace, and Google+ provide us with other options for face-to-face communication, telephoning, and worldwide networking.

These new tools—whether we regard them positively or negatively—also have certain limitations or can be a source of frustration because they affect user behavior. As we all know, cell phone conversations can suddenly be cut off on train journeys upon entering a tunnel or when leaving the city limits behind. It can also be irritating to be forced to listen to the private telephone conversations of fellow passengers in a crowded train compartment. The traditional understanding of the boundaries between the public and the private has been blurred by the use of ICT (Rauterberg 2001). Other spheres of everyday life that used to be clearly delineated also seem to be dissolving and recombining in new ways, if, for example the laptop on the sofa functions as a mobile office in the evening. And finally, one has to conclude that telephone conferences between continents can only partly replace face-to-face contact between colleagues or business partners and are complicated by different time zones.



louisck.cityandict.de

186

The subject of dealing with concerns related to the use of ICT is dealt with later in the book (chapter “Avoid Crash”).

New possibilities and new
limitations through the use of ICT

Differences between women and men

Women often consider themselves less competent in the use of ICT and men also tend to not credit women with as much competence in this area. Presumably, the specific gender roles that still exist in Germany play a part in this. Some women state that they struggle with technology and turn to their brothers, boy-friends, or husbands for help, who in their view can handle technology better and with greater ease. The reluctance to use technology is caused by a lack of knowledge about the application and operation of technology. In the interviews, it was almost exclusively women who mentioned this reluctance.

Apart from the divide according to sex, one can also ascertain a divide according to age. Especially older women consider their technological competence to be very low and are dependent on assistance. An older female interviewee said on this subject: “... *and I myself never bothered about technology, because I always had men around me [...] I’m not familiar with all the functions on my telephone. I can only telephone and reply to calls, that’s all.*” However, the younger female interviewees also mention the discrepancy in user competence between women and men. One of the younger female discussion partners said that she can only use the Internet to obtain information and to communicate via E-mail. Beyond that, she has to resort to assistance: “*I can’t do it. My brother has to help me out. Well, sometimes I do watch films and stuff on the Internet. But I wouldn’t know how to set it up.*” While one female interviewee remarked that she prefers to rely on her husband’s help, “*I suppose I could have attended a course, but I had my husband at home,*” others reported that they taught themselves how to use technology or attended a course.

Apart from the discrepancies in user competences, it also emerged that women use technology in a different way and for different purposes. One female interviewee said on this subject: “*Yes, for us women it has to be something specific and meaningful, rather than clicking and surfing around, sometimes perhaps ending up on something and flitting around here and there. It has to be targeted: what am I looking for and how do I get there?*”

The interviews reveal that women often adhere to a targeted use of technology. Especially among young people, girls use the technologies less for games and more for communication purposes, compared to boys.

Women and men

Unless otherwise indicated, the quotes that follow in this chapter are statements made by interview partners.

See also: Morley (2000)

Differences between Germans and migrants

There doesn’t appear to be a Digital Divide based on the migrant background of the interviewees, in terms of the intensity and frequency of usage. The people we interviewed who have a migrant background use the technologies widely and merely report an age divide among fellow migrants.

According to some people with a migrant background, the language barrier makes ICT usage more difficult for some of the more inexperienced users, as the software products available in Germany or German websites generally have default settings in the German language. One female interviewee remarked on this: “*His daughter in Turkey has an Internet connection with a webcam [...] while they live here and he and his wife just want to see their grandson and their daughter, too. It’s all possible via webcam, you just push a couple of buttons and then it works. But it doesn’t work for him to write an E-mail [...] The programs are all in German.*” A female kindergarten teacher states that parents with a migrant background often have problems registering their child using the standard procedure via a German webpage. They often don’t have sufficient knowledge of German to fill in the forms. The teacher helps the parents by carrying out a personal registration at the kindergarten, in order to work around the language barrier more efficiently.

Migrant backgrounds

Differences between young and old

The Digital Divide with regard to age doesn’t apply only to senior citizens, but also to middle-aged people. Their knowledge and usage of media is limited compared to the younger age groups. Younger people in particular ascribe less ICT competence to the older generation, but they themselves also consider their ability to adopt and use technologies to be limited.

“*It’s no good to me that it’s available, I don’t understand it anyway. Especially for older people who don’t really engage with it, most of the information available isn’t very comprehensible,*” reports an older gentleman. Many older interviewees stated that they are by all means willing to use new technologies, but that in many cases learning the application—which comes much easier to the younger generation—is difficult for people who are more advanced in years. Older people lack practice in handling ICT, and help provided by younger people is often insufficient or difficult to follow. According to a middle-aged housewife: “... *the young people know a lot, but they mostly show you too quickly, they grew up with it.*”

The various age groups also differ with regard to the usage of individual applications. It was primarily younger users who said that they use chat forums. Out of the five interviewees over the age of sixty, only one uses this application. On the other hand many of the older people interviewed have a cell phone for emergency situations, with its use restricted in most cases to the telephone function.

Young and old

Networking—
the invisible city

So far, we have portrayed how the inhabitants of Friedrichshafen actively incorporate new ICT into their daily lives and how its use affects everyday life. Apart from the limits and frustrations regarding the use of ICT, the citizens also experience new ways of facilitating, complementing or adapting their day-to-day tasks. In the following sections, we will shift the focus onto the T-City project and consider what new opportunities the project opened up in the city and to what extent it met the ambitious objectives: raising the quality of life and of the location and increasing the interconnection of urban society through the use of ICT. With regard to this, it is of course interesting to know how the project was implemented within the city and what opportunities and challenges presented themselves to T-City as the project unfolded. It is especially important to consider the inhabitants and how they perceive and experience T-City. Ultimately, it is the citizens who reside in the Smart City and actively bring it to life.

When analyzing the implementation of ICT in the context of Smart Cities and probing into how these technological applications change life in the city, it is noticeable that ICT is virtually invisible in the urban space (Hatzelhoffer et al. 2011b). The mobile terminal devices, although they are in many cases a status symbol, appear inconspicuously small in the urban environment. In contrast to the previous urban infrastructures and networks, the new infrastructural elements are hardly visible. The small constructional changes in the form of switch boxes or transmission masts hardly alter the appearance of cities and don't fundamentally challenge the urban landscape, even if they are sometimes complained about in building culture discussions as blemishes.

Other material manifestations of ICT primarily have functions that support the usage of the new media. Owing to the short innovation cycle of ICT and the corresponding rapidly changing ways of using them, the construction elements don't have a long-term impact on the urban image. The mobile terminal devices have made services such as telephone booths, and Internet cafés—which are at fixed locations in the city—almost obsolete. Instead, there are now other visible signs of mobile ICT usage: on the walls of cafés, on shop windows, on advertising posters, and on other surfaces, one can increasingly see QR codes and indicators of where free WLAN is available or where the use of cell phones is prohibited. This signage is perhaps the most conspicuous indication that new technologies influence our daily lives in the city, along with the actual use of ICT that we can observe on a daily basis in cafés, in public spaces, in parks, or when circulating through the city.

Citizens bring a
Smart City to life.

ICT is virtually invisible
in our cities.

A further aspect of ICT in cities is the use of security cameras, which has also been increasing in Germany in recent years. Cf. Siebel/Wehrheim 2003

QR Codes are increasingly noticeable
around the city.



The low visibility of ICT also has an influence on the attention it is paid by the local population. To put it pointedly, the T-City project has visible and tangible competition within the city, which can present a challenge to the public perception of the project: while anyone strolling along the promenade in Friedrichshafen can gaze at the lake and the mountains and feel a unique atmosphere there, the T-City is barely visible and perceivable within the city.

The virtually invisible ICT
are the basic foundation of
Smart City projects.

066

The chapter "Install" deals in more detail with the challenges faced by the incorporation of T-City into the city.



The orientation of the project: In the opinion of many discussion partners, the project focused too strongly on the technologies or on boosting images and too little on the people. In relation to the latter point, according to an interviewee, there was too little effort to link the project with real people in the city and to connect with them on an emotional and personal level. One female interviewee described T-City as a *“profiling project”* for the city, which was only intended *“for the elite”* but not for normal inhabitants. Another female citizen mentioned the differences in the ways that women and men deal with ICT. She had the impression that the project was created by male techno geeks, who didn’t take the requirements of normal residents into consideration. It was reported in positive terms that T-City succeeded in reaching the target group of senior citizens and involving them in ICT, through the support of the Senior Citizens’ Internet Society, which was viewed as useful and important. Apart from the lack of attention paid to people-oriented aspects, many interviewees also missed the experience of a surprising and innovative moment, which in their opinion would inspire a real project for the future.

Some discussion partners pointed out that Friedrichshafen’s culture and mentality made it difficult to integrate the project within the city. One interview partner commented that the population of Friedrichshafen was too well off to welcome a new project in the city. Other interviewees mentioned with regard to this that the *Häfler* (as the locals call themselves) are not particularly open to novelty.

“Regarding the technology everything has been done. Everything is good and great.”

163

Advantages and usefulness—
a matter of perspective

What has changed then in Friedrichshafen as a result of all the new applications introduced by T-City? Overall, the impact of the project on the quality of life of those we interviewed was perceived as minimal. The perception of the project is often limited to some of its individual aspects, which are generally not recognized as having a purpose in their own right. Nevertheless, some of the interviewed citizens attribute to the T-City project a possible positive impact on the urban situation as a whole. In relation to this, interviewees reported that the project might indeed boost the image of Friedrichshafen or that the city and its industry were experiencing a general improvement of locational advantages. As one interviewee put it: *“Certainly, it is advantageous for industry and for some businesses. According to the information I have gathered it is indeed worthwhile for them.”* Another interview partner emphasized that T-City is important for the city of Friedrichshafen to be able to hold its own in competition with other cities.

In addition, T-City was seen as having potential advantages and uses in certain fields such as healthcare and education. In the field of education, the achievements of T-City were rated as modest by those who were interviewed, even if they could see great potential here for using technological applications. The field of healthcare was mentioned especially often and highlighted positively, as a result of successful and useful individual projects. While the majority of inhabitants don’t experience personal benefits themselves through T-City as a result of this, the telemonitoring solutions and technological support for senior citizens are nevertheless mentioned. For interviewees, these solutions are straightforward and easy to understand.

Apart from the infrastructure, which enables better and quicker access to the Internet, in the interviews the inhabitants rarely mentioned using and experiencing particular individual projects themselves. Some of the interviewees had tried solutions such as *“Kindergarten Online”*, the electronic Citizens Registration Office, or the city portal but didn’t perceive them as a great facilitation and rarely used them. Some interviewees have heard of other projects and rated the ideas positively, but haven’t tried them out themselves yet. Regarding the better infrastructure, it has been noted critically that it can only be used by Telekom customers, thus excluding part of the urban population.

In the discussions, the impact of T-City on the general and individual quality of life in Friedrichshafen was perceived as limited. The representative surveys show that in 2012, only 36 percent of the Friedrichshafen population agreed with the statement, *“The quality of life in Friedrichshafen will improve through T-City.”* This is a similar percentage to the first survey in 2008, hence hardly any change had occurred over the course of the project.

138

More about the notion of quality of life, according to the accompanying research, can be found in the section “The structure of the T-City accompanying research.”

Positive impact on the urban situation as a whole

36 %

of citizens expect that T-City will have a positive effect on the quality of life in the city in future.

Figures from the survey in 2012

53%

have used social networks in the last 12 months

14–29-year-olds 84%
30–49-year-olds 50%
50–65-year-olds 26%

24%

feel overwhelmed by the constant introduction of new ICT

58%

say that ICT facilitates staying in touch with family, friends and acquaintances.

28%

of those surveyed agreed with the statement that they will benefit personally from Friedrichshafen becoming a T-City.

20%

feel that ICT is an invasion of their private sphere.

50%

perceive ICT as an important contribution to the quality of life

54%

are concerned that the protection of their personal data is not taken into account sufficiently when introducing new technologies.

36%

of those questioned agree with the statement that the quality of life in Friedrichshafen will be enhanced.

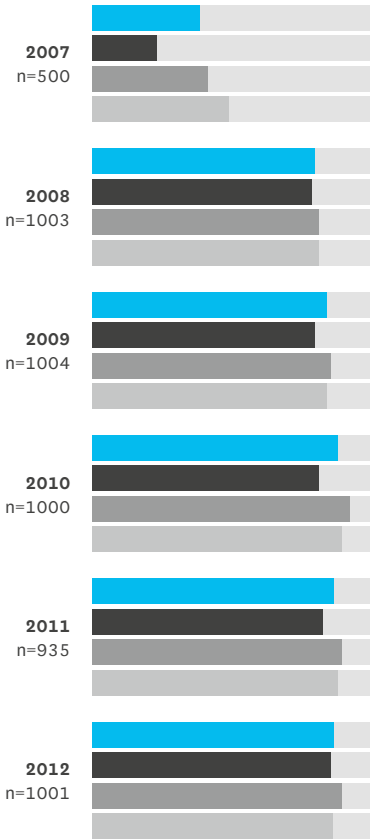
Users 45%
Non-users 22%

Through ICT, levels of personal contact have increased.

14–29-year-olds 44%
30–49-year-olds 23%
50–65-year-olds 19%

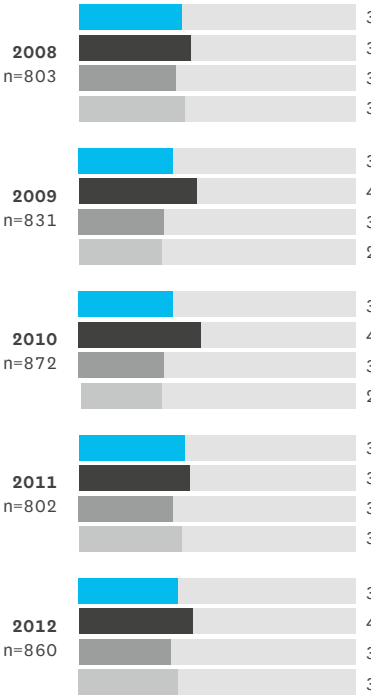
Amongst those surveyed, daily newspapers, TV and radio are used less by 25%, 17% and 17% respectively, because of the internet.

I have already heard of T-City.
(all figures as percentages)



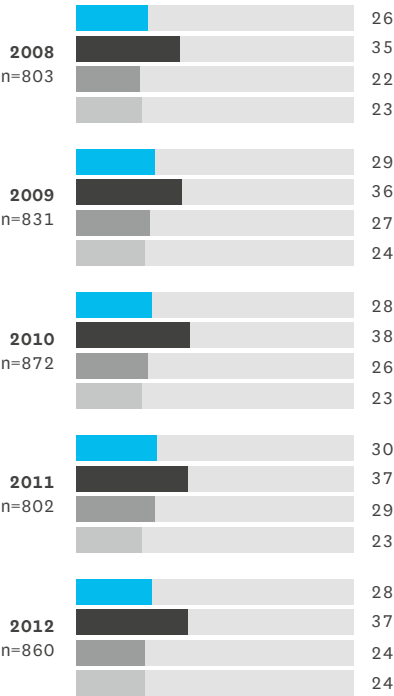
total figure
14–29-year-olds
30–49-year-olds
50–65-year-olds

The quality of life in Friedrichshafen will be enhanced in future through T-City.
(all figures as percentages)



total figure
14–29-year-olds
30–49-year-olds
50–65-year-olds

Expectations of future personal benefits through T-City
(all figures as percentages)



total figure
14–29-year-olds
30–49-year-olds
50–65-year-olds

Smart Meters — a new contribution to saving electricity

by Sebastian Gölz, Fraunhofer Institute for Solar Energy Systems ISE, Freiburg

“Are you trying to save electricity at home?”—presumably, most people would reply to this question in the affirmative. However, this mindset is not sufficient in itself to save electricity: first of all, the power guzzlers in the household have to be identified. Furthermore, members of the household have to be aware of which ingrained habits waste electricity—and therefore also money—and how to improve on this. Some time ago, a new technical device was developed that might help households to economize significantly: the Smart Meter, which records to the second how much electricity is being used when. The data is sent to the monitoring system of the municipal energy suppliers as an automatic read-out via a wireless link. The energy provider can then report back quickly to the users on their consumption—via a personalized Internet portal, SMS, Smart Phone, or posted letter.

The usage of Smart Meters gave rise to the expectation in recent years, especially among political representatives in Berlin and Brussels, that they could help households save energy. Numerous pilot projects in Germany and other European countries researched whether reporting back on electricity consumption could really lead to energy conservation. In a field trial involving more than 2000 households in Germany and Austria, the Fraunhofer Institute for Solar Energy Systems (ISE) studied the responses to feedback sent via the Internet or posted letter, drawing valuable conclusions about saving electricity using Smart Meters. Just the availability of feedback in itself led to a 3.7% reduction in electricity consumption. Households on a time variable rate achieved an additional saving of 6%, the load transfer was only 2% (www.intelliekon.de).

However, it should be mentioned that less positive results were recorded in some other Smart Meter studies. In some cases, very little or no power at all was saved and the participating households expressed their disappointment that the feedback was inconclusive about how to save more power. However, overall the studies showed that many people find the analysis of their electricity consumption very helpful and rate it highly as a monitoring mechanism, making them more aware of electricity consumption as an issue. In particular, the results emerging from the time variable rate show that, with suitable incentives, households can be motivated to take notice of the electricity supply data and adapt their habits accordingly. This could lead to households taking a more active role in transforming the supply of electricity in Germany. Combining Smart Meters with power generation through photovoltaics or CHP stations provides new product options for utility companies, service providers, and those with solar power systems.

In order to achieve further progress with saving power and energy, there is more and more research into smart measuring and monitoring systems in the home (Smart Home), which are better suited to people’s individual requirements.





189

Avoiding crash— dealing with concerns

“It is very dangerous to listen. If you listen, you can be persuaded.”

Oscar Wilde

In the digital world, there is nothing worse than experiencing a technical crash. However, crashes are also feared in other areas. It also applies to the concrete implementation and execution of projects like Smart City. Thus, this chapter deals first of all with the question of how the risk of a T-City crash was avoided in Friedrichshafen. What was done to ensure the success of the project even in difficult times? How were the respective partners brought together? What mechanisms were developed to hold the very unequal partners—the city and the corporation—together for the long term?

Secondly, it became clear while putting the project into practice that—despite the opportunities provided by modern information and communication technology (ICT)—some people have reservations about using cell phones, laptops, or social networks. Is the radiation necessary for mobile communications in fact harmful, despite all the research and socially negotiated radiation limit values? Is our data really secure, or can it be lost in virtual space and read by strangers or even tampered with? Will the new technology take over and change personal relations? These and similar questions are asked by many users, not only in Friedrichshafen, but also by the wider public regarding the daily usage of new media in Germany.

This chapter presents various perspectives, resulting from the research into the procedures and the impact of the T-City project in Friedrichshafen, with regard to two issues: dealing with the difficulties presented by a concrete Smart City project, and the reservations towards the daily usage of the new information and communication technologies.

The risks faced by
the cooperation

Concerns and fears

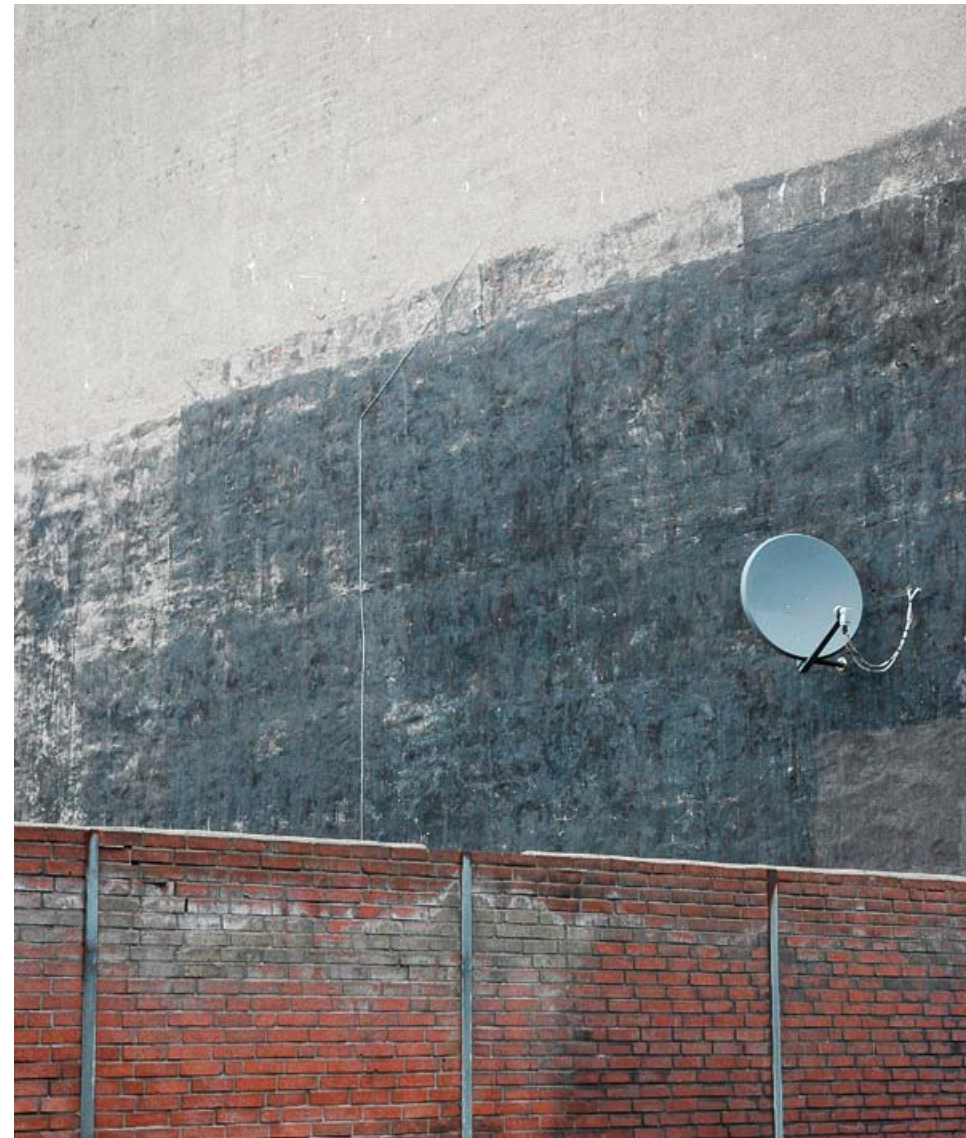


Data protection has various facets

Taking into account not only the results of the survey, but also the statements made in the interviews held as part of the accompanying research in Friedrichshafen, it becomes clear that the issue of data protection has many different facets. On the one hand, it is about the question of how the personal data is handled, which the user himself makes available on the web. The comments on this in our interviews range from convictions such as, *“I know that the data is sold for advertising purposes,”* to general concerns such as, *“In the end, it can’t be ruled out that this information is perhaps also used for criminal purposes.”* The fact that a telecommunications service provider has access to information that gives him the location of the user and could use this to his own advantage is perceived as alarming by some people. This issue was the subject of public debate in Germany in spring 2011.

Furthermore, it is speculated that personal information in cyberspace is visible to others who should not be seeing it. During a group discussion, seventh-grade students from a secondary school in Friedrichshafen were very aware that it was advisable to upload their photos onto social networks with the *“friends only”* setting, which limits who would be able to view them. However, the students were largely unaware of the possibility that their personal data might be used by network providers. This is also a source of subliminal unease among adult users. Users have no retrospective control over the possibility of uploaded data such as photos later being analyzed in detail using new technologies, such as face recognition, and being automatically linked to other arbitrary data.

Students are aware of some of the dangers.



The concerns and fears with regard to the handling of personal data are also leading to protests in areas of daily life that up until now have had nothing to do with the issue of data protection. A concerned Canadian citizen secured his traditional electricity meter in such a way that the electricity provider couldn’t exchange it for a Smart Meter (Calanego 2012). The increasing implementation of communicating technologies opens up new issues. For instance, the use of Smart Meters—the intelligent meters for measuring electricity consumption, which enable the direct reading of values by the electricity supplier—makes it possible to draw conclusions about the personal behavior of the electricity customer. Researchers from the University of Applied Sciences Münster carried out a practical experiment, which showed that the data transmitted by a Smart Meter even enables deductions about which television programs are being watched (Greveler et al. 2011).



chat.cityandict.de

“Intelligent electricity meters give everything away”

Andreas Bentz, T-Systems (Wimmer 2011)

E-government in Germany: progress, naivety, and déjà vus

by Tino Schuppan, Professor of Public Managment at the Institute of the Federal Employment Agency and Director of Science at the Institute for E-government (IfG.CC), Potsdam



For more than a decade, e-government has been driven forward in Germany on all state levels. The start of this process was closely linked to the development of the Internet, although it is often disregarded that the use of information and communication technology (ICT) in administration already has a long history. The administrative information systems that emerged in the nineteen-seventies were already tasked with linking ICT to the modernization of administration. Whether intentionally or not, the use of ICT brought about organizational changes that were probably greater than many of the widely proclaimed management reforms.

The start of e-government in Germany can be traced back to the end of the nineteen-nineties, when large cities began to develop their web pages. At that time, city governments were primarily concerned with the portrayal of their cities, with some information about municipal services. E-government was limited to a showcase function, featuring the mayor's "famous" short welcoming address. Therefore, organizationally, it was then in the remit of the municipal public relations offices.

The project Media@komm, with which the Federal Ministry of Economics aimed to achieve a breakthrough for the electronic signature, is regarded as a milestone in e-government. Although at the end of the nineties Germany had the first electronic signature law in the world, there were hardly any applications for it. The first phase of e-government was characterized by technical naivety, experimentation, and errors—although large cities in particular, such as Mannheim or Stuttgart, were quick to recognize that e-government also necessitated changes to administrative processes.

The initiative BundOnline 2005 was set up in the year 2000 with the aim of making all web-enabled federal services available online. This concept is problematic because: 1) the state actually offers very few services directly to citizens; 2) not every "web-enabled" service is necessarily suitable for the Internet; and 3) the objective of "putting everything possible online" limits the project to a large extent just to online services, while not dealing with matters such as the reorganization of administration and its processes on the basis of ICT.

A new phase of e-government began in 2005 with the initiative Deutschland Online. Representatives of all administrative levels participated in this program because it finally acknowledged that an approach that spanned all administrative levels was necessary. It pushed for numerous standardizations, however the strategic objective was not always quite clear. In some areas of practice and e-government research in the field of information technology, the notion still persists that an overarching form of cooperation can only succeed by means of standardization, disregarding all too often that administration also has to be capable of cooperation on a cultural, organizational, and individual action level.





227

Taking chances— learning from experience

“Those who don’t make mistakes are not innovative enough.”

Hamid Akhavan, former Chief Technology Officer, Deutsche Telekom

Every program in the digital world needs to be updated regularly. The practical use of the programs reveals their operational problems; furthermore, weaknesses in their development and installation become apparent retrospectively. Repeatedly opening and using programs on a daily basis reveals that small improvements are necessary and that certain optimizations would be helpful. Mistakes that were made at the development and installation stages can be corrected and eliminated by means of an update.

This concluding chapter will provide a further comprehensive summary of the current significance of Smart City concepts. Some twenty years after the term was first used in expert circles and about five years after a profusion of Smart City concepts started cropping up all over the world, it is time to take stock of these new initiatives. This is the first aim of this book.

The second aim of this book is not to present Smart Cities in an abstract and generalized way, but instead to provide a more in-depth analysis of a concrete Smart City project by using specific examples and to relate it to the context of urban development concepts. The T-City in Friedrichshafen at Lake Constance presented itself for this purpose. Around five years after this project was launched, the time has come to present a summary introducing the unusual Public-Private Partnership (PPP) between Deutsche Telekom and the city of Friedrichshafen. The presentation of this Smart City project shows how the inhabitants react to the new information and communication technologies and to what extent they take up the concrete offers.

After the summary, we conclude with four questions, the answers to which we consider to be the central messages of this book: In what ways are the new Smart City concepts integrated into spatial structures? How do the integrative Smart City concepts relate to the urban development debate in Germany?

How should a partnership between private and public sector partners be structured in the future when putting such concepts into practice? How can Smart City concepts foster the enthusiasm of the users too?

Recommendations for Smart Cities

The following tasks can be identified as recommendations for the development of a vibrant Smart City based on a Public Private Partnership:

— **Clarify the defined objectives**
The common and differing objectives of those involved have to be identified and communicated.

— **Clarify the role expectations**
Furthermore, it is necessary to formulate clearly the respective mutual expectations regarding services and performance.

— **Set up a project structure**
It is essential to set up a joint project structure with responsibilities and decision-making processes that are transparent both internally and externally.

— **“Open Culture”**
Resources and processes for an “Open Culture” have to be provided, if a Smart City project is striving for the ambitious objective of incorporating a whole urban society. All partners involved have to be supported in adapting existing processes and cultures in relation to the project cooperation.

— **Communication**
It is necessary to communicate the objectives, structures, processes, and operative procedures continuously. One has to choose suitable information channels for the respective addressees (press, radio, events, testimonials, newsletter, database, web, blog, wiki, social networks). This communication has to be directed both internally in relation to the project and externally to all the relevant target groups.

— **Regular reviews**
It is necessary to review the objectives, structures and processes regularly. In long-term projects, fluctuating external circumstances, technical and organizational innovations, and changes in the attitudes of individual partners are to be expected. Therefore, regular assurance with regard to the agreement is required.

— **Willingness to listen**
It is essential for all the involved partners to be willing to listen to each other and to all the relevant target groups, especially when critical or skeptical comments are expected.

— **External evaluation**
An external accompaniment of the procedures in the form of continuous evaluation, as well as of presentations and consulting during the review phases, offers the advantage of an external point of view, which helps to identify one’s own blind spots and wrong turnings.

— **Suitable partners**
Ideally partnerships are “complementary.” One has to choose partners who have differing competences in relation to the problems that have to be solved. The partners should extend and complement each other and not compete within a project. Furthermore, for the success of complex projects that require a high level of cooperation, it is important that both parties are equally interested in achieving success.