

# Innovation and product development.

## Connected life drives innovation

### Innovation drives product networking forward.

The vision of connected life and work is the leitmotif of our innovation process. After all, our products are connected with each other. We view and develop them from the customer's perspective, because in our opinion, every customer should be able to decide his or her personal digital lifestyle. And we want to help them to do so. However, connected life and work is not only relevant for our products, it also plays an important role in innovation and product development, creating close links between our experts, external partners, and also customers.

Our Products & Innovation unit is responsible for innovation and product development – from Group-wide research & development as well as innovation management and marketing, through to product development and management, and management of our product portfolio. The aim is to develop innovative and competitive products, services and business models. We are pursuing the joint mission of Superior User Experience & Simplicity drawing on broad knowledge of markets and customers in conjunction with innovation and technology expertise. Customer focus, simplicity, an outstanding user experience, a high-quality product portfolio, and sustainable profitability play a key role in this context.

### Everything starts with an idea.

When it comes to innovation, we act according to the principles of open innovation and user-driven innovation. We develop innovations together with customers and partners – always focusing closely on the needs of our customers. One instrument, for example, is the Creation Center, which develops product ideas and concepts for all units of the Group. Together with researchers, we quite literally look into customers' living rooms and develop consistent concepts for consumers together with the product managers.

Our Group's research and development activities are brought together at Deutsche Telekom Laboratories (T-Labs), a private scientific institute affiliated to the Berlin University of Technology (TU Berlin). Around 180 scientists as well as 180 experts from Deutsche Telekom work in Berlin, Darmstadt, Beer Sheva (Israel), and Los Altos (California, United States) to develop prototypes for innovative products and services. T-Labs primarily works on projects and new technologies that are expected to be marketable or launched in 18 months to five years.

We participate in national and international forums and committees to help shape future products and services, incorporating our interests and the wishes of our customers. Our T-Labs are networked with international partners from industry and renowned research institutions.

In order to find out what customers want, T-Labs set up the Innovation Forum: More than 900 Berlin households help in product tests, surveys, and on-site research. T-Labs also holds workshops in order to identify needs better and faster, some with specific target groups, such as senior citizens or young women. Those responsible for product development and design use these findings and put them into practice.

Business ideas generated by T-Labs that we do not adopt into our product portfolio, but which demonstrate a clear benefit for customers and are predicted to succeed in the market are spun off from our Group as independent companies. Providers of venture capital, such as T-Venture, give these spin-off companies not only the necessary equity capital, but also important expertise to then operate independently in the market. So far there have been four spin-offs from T-Labs, the most recent being YOOCHOOSE and wahwah.fm. To increase the number of spin-offs, we perform what is known as incubation management, which develops good ideas into marketable products faster and more systematically. The Entrepreneurs program at T-Labs has been devised to support internal and external start-up teams in unlocking potential from disruptive technologies by providing seed funding, for instance.



### Ever shorter innovation cycles.

Innovation cycles are getting shorter all the time. For us in the telecommunications industry, this means that new products need to be developed in ever shorter periods. This requires new concepts, which is why we hold to the principles of open innovation. Allowing all those who are interested in the solution to a problem to work together openly and intensively means marketable products can be developed much faster. One of our examples of this is the Android project to further develop an open platform for cell phones. However, innovations for our customers also result from open competitions, such as the IPTV Competition to further develop our Entertain product. Our Developer Garden portal addresses the software developer community, offering them our toolboxes to bring new software solutions for Internet applications to market maturity. By 2012, T-City Friedrichshafen will have been transformed into a city that is a living example of the quality of life and community amenities in the future. Numerous innovations – from caring for people with cardiac problems through to remote reading of electricity meters – are being tested using state-of-the-art fixed-line and mobile infrastructure.

### Patents and awards.

**Patents.** In the market for mobile and fixed-network telephony, intellectual property rights are extremely important, both nationally and internationally. We are therefore applying ourselves intensely to in-house development and the acquisition of rights. The number of patent applications increased in 2010 by 28.1 percent year-on-year to 913. At the end of 2010, the Group held 7,434 intellectual property rights (inventions, patent applications, patents, utility models, and design models). The portfolio is reviewed on a regular basis, and the rights that are no longer relevant are eliminated. When managing these intellectual property rights, we specifically consider cost/benefit aspects.

**Awards.** The success of our innovation work is also reflected in numerous awards won by the Company, its products and its employees. In 2010, for instance, T-Labs received the Open Innovation Award in the research and development category. Since opening, T-Labs has already received over 50 prizes and awards, such as the Berlin Science Award in 2008, the Johann Philipp Reis Award in 2009, Convergator of the Year 2009 and, most recently, the Leibniz Award in 2011, Germany's most coveted prize for scientific research. For several years in a row, our developments have received the Voice Award for the best interactive voice response systems, i.e., voice-controlled telephone services.

**Public Private Partnership Innovation Award.** The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt) and T-Systems received the Public Private Partnership Innovation Award for their ten-year ICT services outsourcing partnership. In addition to the innovation factor, the judges also took account of cost-effectiveness, efficiency and an appropriate distribution of risks between the partners.

**Award for an innovative solutions portfolio.** According to Cisco and IDG Global Solutions, T-Systems is the first provider to create a service that optimizes applications in global corporate networks. For the Application Performance Management solution T-Systems won the award in the Most Innovative Service Offering category. This service enables international corporations to boost the performance of their worldwide corporate network and multi-site applications – by a factor of up to 50.

**New Product Innovation Award for T-Systems.** Each year, the international consultancy Frost & Sullivan grants the New Product Innovation Award to companies with innovative products and cutting-edge technologies. T-Systems received the award for a new electronic toll collection solution.

### Research and development results.

It is important to us that the results of our work are transferred to our Group units, which can use them to put new products and services on the market for our customers.

One example of such a transfer is the recommendation system from the Cologne-based start-up company YOOCHOOSE. Their Recommender Engine for Web services is based on technologies and patents originating from our T-Labs. What makes this solution stand out from other recommendation systems is the extraordinarily precise selection of relevant content; product information is tailored precisely to the individual user. The solution has been designed in such a way that it can be quickly adapted to different areas of application, e.g., for Musicload, Gamesload, and other portals. We will install Recommender Engine on other portals, such as Videoload, and offer the recommendation service across all portals. Thus when customers use our portals, they will automatically receive additional recommendations for other suitable Deutsche Telekom products.

Another example is the SEE ICT project (Solutions for Energy Efficient Information Communication Technology) in which solutions are developed for reducing the energy requirements of Deutsche Telekom's network platforms. After all, it takes more than the output of one large power plant to operate these platforms. Based on the findings of the project, the power consumption of network components has become one of the procurement criteria. Together with our subsidiary Power and Air Solutions, model calculations are being used to develop incremental concepts, for example for power supply at operating sites, including factors such as the aging of items of equipment. In mobile communications, an industry whose power requirements are considerable due to the simultaneous operation of three different transmission technologies, it was possible to reduce energy consumption of base stations in the short term.

Many mobile devices have movement sensors and navigation capability that can also be used for mobile multiplayer games. Thanks to intelligent software, the games can also be adapted to specific situations. A Software Development Kit (SDK) is being designed as part of the Adaptive Mobile Gaming project to support developers in the creation of mobile multiplayer games. A cell-phone version of the board game Scotland Yard was created as a demonstrator. The Mister X Mobile game, which was developed in collaboration with the University of Bonn, met with a very positive media response in the reporting year and is available from Gamesload or as an app from the iTunes Store. The results obtained in the project form the basis for the further evolution of the Software Development Kit.



## Innovative products, high-speed networks and ongoing developments.

In the past financial year, we developed a number of new products and brought ongoing developments to market maturity. These innovations include:

**Roll-out of the 3G network on the basis of HSPA+.** We upgraded our 3G networks to the HSPA+ standard in Germany, Austria, the Czech Republic, the Netherlands, Poland and Greece. With HSPA+, T-Mobile USA now offers transmission rates that are even comparable to a 4G network – with better coverage than all its competitors. We also substantially simplified data roaming; customers in the United Kingdom can now book roaming passes by text message or on the Internet and know right from the start what the services cost.

**DeutschlandLAN.** DeutschlandLAN is the network-based solution for all business communication in the office and on the go. A standardized user interface acts as a communication center to integrate all communication channels such as telephony, e-mail, text messaging, and instant messaging for connected work.

**Cloud services.** T-Systems is world leader when it comes to standards for new services such as cloud computing, i.e., the use of data and software from the Internet. Since T-Systems complies with German data security regulations, which are strict by global comparison, it has a clear competitive edge in the international market. For years, T-Systems has successfully supplied customers around the world with cloud computing services under the name Dynamic Services, which enable companies to cost-effectively procure, add, and cancel IT resources at all their locations at short notice. They can thus push IT projects or establish new business models quickly without taking any investment risk. They only use and pay for what they really need. Dynamic Services can be integrated seamlessly into any existing ICT landscape, providing considerable protection for investments. Beyond “traditional” cloud computing, T-Systems also integrates network services, applications and desktops.

**Tapping into future markets with intelligent networks.** In the area of intelligent networks, T-Systems focuses on the connected car, healthcare and efficient energy management. Examples include the use of the Internet in the car, satellite-based toll collection systems, automatic calls to emergency services, and voice-controlled e-mail. In the healthcare sector, T-Systems connects the various areas securely and conveniently. In addition,



T-Systems supports what is known as integrated healthcare, where patients benefit from interdisciplinary care and treatment – from hospital doctors, GPs, specialized therapists and rehabilitation clinics. A solution is already available for efficient energy use in the form of smart metering, which creates the necessary transparency by providing to-the-minute readings of power consumption in private households. T-Systems is currently working on a solution for the electricity grids of the future, so-called smart grids that reconcile fluctuating production (from wind or solar power) with consumption. T-Systems benefits from its expertise in operating complex networks and its industry expertise in the energy sector.

**Mobile Enterprise.** Companies are becoming increasingly mobile. T-Systems supports them in this process and made considerable advances in the reporting year in the Mobile Enterprise service portfolio, in which T-Systems bundles all services mobile terminal equipment for corporate use – whether traditional cell phones or more modern tablets. This portfolio includes connection issues and the management of the equipment including the corresponding security services – as fully managed services or, alternatively, as services from the cloud.

**LIGA total! goes interactive.** The “personalized soccer coverage” function. This function allows our customers, for example, to select only those broadcasts of Bundesliga games being played simultaneously on a any given match day that they are interested in. The trial add-on option LIGA total! Spieltagskarte gives Entertain customers the opportunity to enjoy the soccer broadcasts on any given match day of their choice and thus test the LIGA total! service without having to subscribe to it for a fixed term.

**MyPhonebook.** MyPhonebook targets the mass market, providing all customers with a secure, easy-to-use network-based address book which can be accessed on a variety of terminal equipment and screens. In addition to telephony, text messaging, e-mail, and voice mail, other services such as the Media Center or new communications services will increasingly build on this function in the future. Visual Voice Mail (VVM) and Mobilbox Pro already provide customers with a user-friendly voice mail service.

**DT One Music Platform.** A uniform platform for music download services was successfully rolled out in the Group in November 2010, allowing us to generate synergies in the operation of the services and a uniform presence for fixed-network and mobile customers. The DT One Music Platform hosts the German site Musicload as well as the music download shops of Deutsche Telekom companies in other countries.

**New PayTV portfolio, launch of an HD package.** The entire Entertain PayTV portfolio was restructured in 2010. Our Entertain customers now have a choice of six PayTV packages from various genres. We also significantly increased the number of HD (high definition) channels in 2010.

**Machine-to-machine competence center.** In February 2010, we established the machine-to-machine competence center (M2M CC) to tap another forward-looking business area. The M2M CC integrates smart services into retail products on the basis of strategic alliances. For example, BMW's Connected Drive service now provides additional benefits for the driver via the next-generation mobile network, such as the eCall emergency service function, traffic information, and personal communication via e-mail. Technical and commercial structures established by the M2M CC made it possible to market segment-specific customer solutions worldwide. In addition, the M2M service quality was specially researched to define new standards which can minimize the consequences of faults in critical applications, for example in the healthcare sector.

**Innovation Center in Munich.** Hands-on future: T-Systems opened its first Innovation Center in the Bavarian capital to bring innovations alive. Companies will be able to test new information and telecommunications solutions in a realistic working environment on a test site covering approximately 450 square meters on the Euroindustriepark in Munich. Customers can contribute their own ideas for the further development of solutions and tailor them to their own requirements. The Innovation Center's research partner is the Ludwig Maximilian University in Munich.

## Expenditure and investment in research and development.

Research and development expenditure in the narrower sense relates to pre-production research and development, such as the search for alternative products, processes, systems, and services. However, we do not include under this item expenses for the development of system and application software aimed at enhancing productivity. In the 2010 financial year, research and development expenditure in the Deutsche Telekom Group amounted EUR 0.1 billion, which is less than in prior years. The parent company, Deutsche Telekom AG, accounts for the majority of research and development expenditure in the Group. Here too, expenditure decreased year-on-year.

Deutsche Telekom's investments in internally generated intangible assets to be capitalized totaled EUR 0.2 billion (2009: EUR 0.2 billion). These investments primarily relate to internally developed software, mainly for the Germany operating segment. In the reporting year, over 2,200 employees were involved in projects and activities to create new products and market them more efficiently.