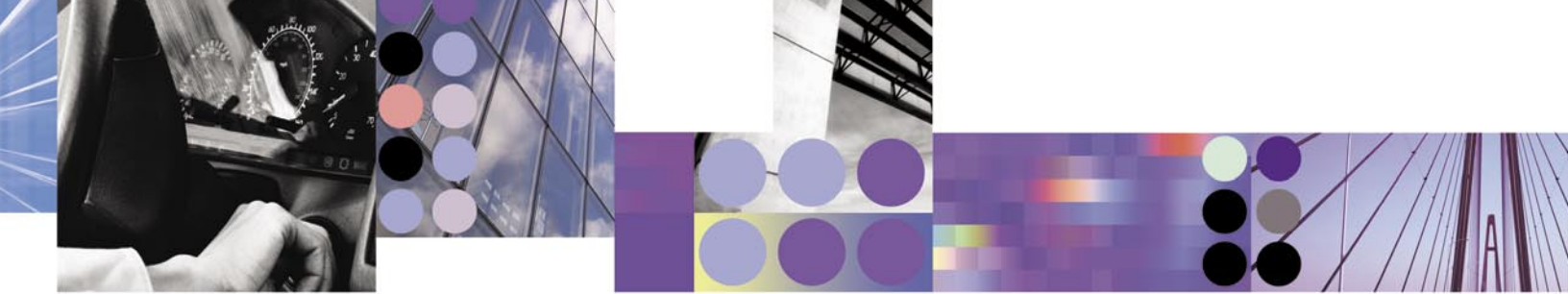**IBM**

Focus on the road ahead:
IBM puts practical telematics within reach.

A road to increased customer loyalty

Telematics — the convergence of telecommunications and informatics — is poised to help you deliver on customer expectations in a wireless world. It offers exciting new ways to keep you better connected to your customers, while allowing your customers to keep in touch with the world around them. Telematics stands to change the way we live. Communicate. Conduct business. Even manage personal safety issues.

In today's business world, telematics represents a new avenue to provide customer-centric offerings that are designed, deployed and brought to market faster, at lower cost and available on demand. Telematics is a road that leads to increased customer loyalty and greater profitability.

Telematics also offers you the opportunity to enhance your business — breaking down the walls between silos to help improve engineering and manufacturing, deliver supply chain efficiencies and reduce warranty costs. Using 'Vehicle Intelligence' effectively can help you differentiate your brand and provide real competitive advantage.

IBM pioneers telematics

IBM is helping companies in the automotive, petroleum, insurance, telecommunications, heavy equipment and transportation industries, as well as governments around the globe, take advantage of the new capabilities that telematics technologies offer.

From hardware and software solutions to consulting expertise that aligns business processes for greater efficiency and profitability, IBM helps customers break new ground. Each day, as the number of potential telematics applications grows, so do the list of organizations and their customers who stand to gain from them.

As one of the pioneers in telematics research and development, IBM can offer your company an end-to-end solution, whether you want to build an offering from the ground up, or expand on your existing telematics programs.

Delivering cost-effective telematics, on demand

In the automotive industry, telematics-equipped vehicles have already begun to draw some attention in the marketplace. But so far, their availability has been limited by the expense of proprietary systems, which are dependent on hardware and software packages that reside onboard the vehicle and require large data-storage capacity. In addition to their expense, these systems often require manual upgrades and have a tendency to grow obsolete long before the end of the vehicle's useful life.

To make telematics more readily available to car buyers — and more cost-effective for automakers to develop, deploy and manage — IBM is leading the industry towards an 'off-board' approach where the value to the user can be delivered on demand. That approach means keeping the bulk of the computing power outside the vehicle to leverage both existing and developing technologies, making telematics-equipped vehicles less expensive to offer and easier to upgrade remotely. By reducing both the cost and bulk of equipment built into each vehicle, automakers can more easily expand telematics functionality across price classes and increase profitability before and after the sale of these vehicles.

Reaching the potential of telematics requires an environment that can deliver value on demand, while adapting rapidly to unpredictable internal and external pressures — be they technological, economic, political or social. And the early adopters of on demand environments for telematics will dramatically change the way the industry acts. A focused company develops and sells products that its customers feel passionately about because they concentrate on developing a deep understanding of their customer's needs and deliver value to their customers when and where it is needed at an acceptable cost to the user.

A new world of hands-free functionality

At IBM, our goal is to help automakers deliver both safe and convenient telematics functionality to their customers. Using IBM ViaVoice® software, an interactive voice technology, drivers can gain access to a range of services without having to take their eyes off the road or their hands off the wheel. Systems can also be engineered to shut down specific functions when the vehicle is in motion, during braking or at other key points where a distraction could adversely affect the driver. As has been the case with cellular technology, consumer awareness campaigns illustrating the appropriate times to use these devices will play a role in helping protect the safety of drivers and passengers alike.

Voice technologies can also relay navigation information, faxes, phone calls and Web content, eliminating the need for the driver to look at a dashboard screen. Existing proprietary technologies already notify emergency services at the time an accident occurs. Further extensions of this could include vehicle sensors that can detect the severity of the damage to the vehicle, and notify a driver's insurance provider if they opt-in on the service. By reducing the time it takes emergency services to respond, this technology could save lives. The actual vehicle data gained could also aid automakers in designing safer vehicles and help reduce the cost to insurers.

The personal automobile — from mere conveyance to wireless convenience

During the last few years, wireless communication devices have seen explosive growth in Korea. However this market is somewhat saturated and customers are looking for more sophisticated wireless solutions. To address demand and maintain its leadership position in Korea's automotive market, Hyundai (HMC) wanted to implement built-in wireless devices in its automobiles. To achieve this goal, it needed to build telematics devices along with a mobile database and synchronization solution. So Hyundai created a suite of advanced interactive communication services based on open standards to ensure flexible and scalable growth as market shifts occur. Among the new services for drivers and passengers expected to be launched are: Airbag deployment notification; remote theft-alarm and stolen vehicle tracking via Global Positioning System (GPS); a portal delivering news updates, weather and stock quotes; e-mail and Internet access; data synchronization for personal digital assistants (PDAs), mobile phones and other devices; 24-hour assistance and concierge services.

A recent report by JD Powers, rating customer satisfaction with in-car navigation systems, found three cars in the top five contained voice technology powered by IBM Embedded ViaVoice software. These cars were from Honda who extends their leading edge technology to the mass market through their best selling cars to attract new customers and demonstrate industry leadership. Today, in select Honda and Acura models, drivers can ask for directions and hear responses over their existing car audio systems. Based on technology jointly developed by IBM and Honda R&D, this navigation system uses IBM Embedded ViaVoice. The new system has vocabulary of approximately 180 preset commands and can recognize a range of accents. New features include a larger touch screen display with split screen design and an expanded database that covers virtually all U.S. roads and seven

million points of interest (compared to one million for most systems currently in the market). The technology is integrated into the car's audio system, so driving instructions can be heard through the speakers. The 'Touch by Voice' human recognition system is designed to minimize need for keyboard entry.

Demonstrating real-world insight into telematics

IBM has a complete end-to-end telematics reference implementation to demonstrate how an open-standards based architecture enables companies of different sizes and industry types to participate in their own chosen portion of the telematics eco-system. Showcasing several of our customers' use cases, the telematics reference implementation includes realistic scenarios such as customer service provisioning, interactive voice response for consumer navigation, personalized information, fleet management services, emissions monitoring, and usage-based insurance tracking.

An advanced diagnostics/prognostics application addresses one of the most important aspects of telematics services — offering automakers real-time insight on how their vehicles are performing and providing drivers with assistance before vehicle problems arise. Scenarios dealing with engine overheating, engine misfiring, a loose gas cap, airbag deployment and health checkups demonstrate how the driver can be informed, alerted or warned about vehicle health status. Built on the IBM's pervasive computing open end-to-end architecture, the reference implementation provides the foundation for our customers' to deliver a real world, production-quality telematics solution.

Automotive applications are just the beginning

Certainly, the automotive industry presents an abundance of opportunities to put telematics solutions to work. But it is by no means the only industry that stands to make significant gains for both companies and their customers. Currently, IBM is working with leaders in several industries to bring this vision to life.

Examples of potential uses in other industries include:

Insurance and Risk Management

IBM is working with the insurance industry to develop better risk-assessment strategies. For example, we are working with Norwich Union to collect vehicle data and the driving habits of a policy-holder (who opts-in) to establish fair premiums based on a car and driver's actual safety record. Or use GPS technology to manage assets that have a defined geographic area of coverage, such as rental cars or commercial equipment required to be kept within national borders.

Petroleum

In conjunction with the petroleum industry, IBM is helping to bring telematics curbside. By using wireless technology at the pump, consumers could download music, Web content and e-mail through short-range data transmission. By designing more intelligent gas stations, pumps could be programmed to communicate with vehicles as they pull up, initiating payment authorization and calculating the driver's fuel needs instantaneously.

Transportation

IBM is working with innovators in the industry such as International Truck (Navistar) to use the real-time data transmission capabilities of telematics technology to improve fleet and driver productivity by linking vehicle data with their core systems. This solution provides International with brand differentiation, competitive advantage and improved profitability. We are also working with companies to design systems that could monitor sensitive cargo, like perishable foods, to reduce liability and take advantage of actual capacity on a daily basis.

Public Sector

Intelligent Transportation Systems (ITS) help the public sector work more efficiently. Already in use in Europe, Japan and other parts of Asia Pacific, ITS has shown that traffic flow and civil engineering projects can be greatly improved using the real-time data collected from telematics systems embedded in roadways, sidewalks and other structures. Using vehicle-based technologies, emergency service response time could be reduced significantly, with immediate notification of an event and GPS navigation systems leading crews directly to an emergency.

Every day, practical research at IBM sparks new ideas for additional applications in the field of telematics. And using an open standards infrastructure, adding new applications and content from disparate sources is easier to manage.

Cutting-edge IT technology to match your cutting-edge automotive skills

To advance the future of telematics, IBM employs the same breakthrough technologies that have placed us at the forefront of e-business.

These solutions include:

IBM WebSphere® Everyplace® Server
Provides the open, mobile application platform to deliver multiple network-connected services with speed and ease.

IBM WebSphere Portal Server
Delivers access to the information, people and applications your customers need, without an information overload.

IBM WebSphere Commerce Server
This transaction software will help propel your company into the next generation of e-commerce.

IBM WebSphere Voice Response
A versatile platform bringing expanded functionality to Interactive Voice Response (IVR) applications, including advanced speech recognition and VoiceXML for the Web.

IBM uses open Internet technologies

Open Internet language and architecture
Including eXtensible Markup Language (XML), Simple Object Access Protocol (SOAP), Web Service Description Language (WSDL) and Universal Description, Discovery and Integration (UDDI) — to allow Telematics Service Providers (TSPs) to deliver dynamic content to customers on demand.

Java™ technology based network computing solutions
Make use of embedded microprocessors onboard to download real-time information services to drivers and passengers.

Hardware
- *GPS chipsets*
- *@server systems*
- *TotalStorage*

Embedded development suites

IBM WebSphere Studio Device Developer
Based on embedded Java 2 technology, this suite of tools is used by Daimler-Chrysler, Motorola and Intel Corporation to develop the future of vehicle-based embedded computing.

IBM Embedded ViaVoice interactive voice-recognition software
Allows both in-cabin and wireless hands-free operation for navigation, phone and Web services.

Telematics Reference Implementation
A complete end-to-end telematics reference implementation that can be used by partners and customers to test their reference platforms, devices and applications. Supported and demonstrated use cases include: Service Provisioning, Diagnostics and Prognostics, Usage-based Insurance pricing, Emissions Monitoring, Interactive Voice Response, and Personalized Information.

Services

Telematics Readiness Assessment
In-depth industry and telematics experience to help customers interested but uncertain on how to begin a telematics program. Service includes business, technology and organization readiness assessment.

Telematics Business Case Development
In-depth business consulting services for developing return on investment model including market segmentation analysis to identify direct and transformational opportunities, value propositions, business model(s), pro-forma solution, financial case and recommendations.

Telematics Solution Outline
Proven telematics experience to define an appropriate telematics solution for your selected market. Includes preparation of high level requirements, solution design and architecture, high level plan, order-of-magnitude estimates, refined business case.

Telematics Solution Implementation
Extensive telematics experience and business knowledge combine to deliver the best systems structure for you including detailed requirements and plans, final architecture, detailed design, build, testing and deployment of end-to-end telematics systems.

Telematics System Management
From local to global implementations, experienced skills are available to support operations of complex systems, managing problem, change and configuration. management.

Telematics Project Management
Overall project management services, including system engineering support, test planning and execution by a team experienced in telematics implementation.

Telematics Go To Market Strategy and Organizational Design
Service designed to confirm market segmentation; establish channel development plan, alliance/partner strategy, identity statement and organizational strategy and planning.

IBM ASIC Design and Build Services
IBM designs and manufactures application-specific integrated circuits (ASIC) chips for products ranging from servers to cell phones. IBM has been ranked as the #1 supplier of ASICs by Gartner Dataquest.

Wireless Security Services
IBM Security and Privacy Services help your company assess, architect, design and build security-rich wireless e-business solutions.

IBM combines extensive business expertise across industries with the leading brands in e-business to deliver a complete end-to-end telematics offering.
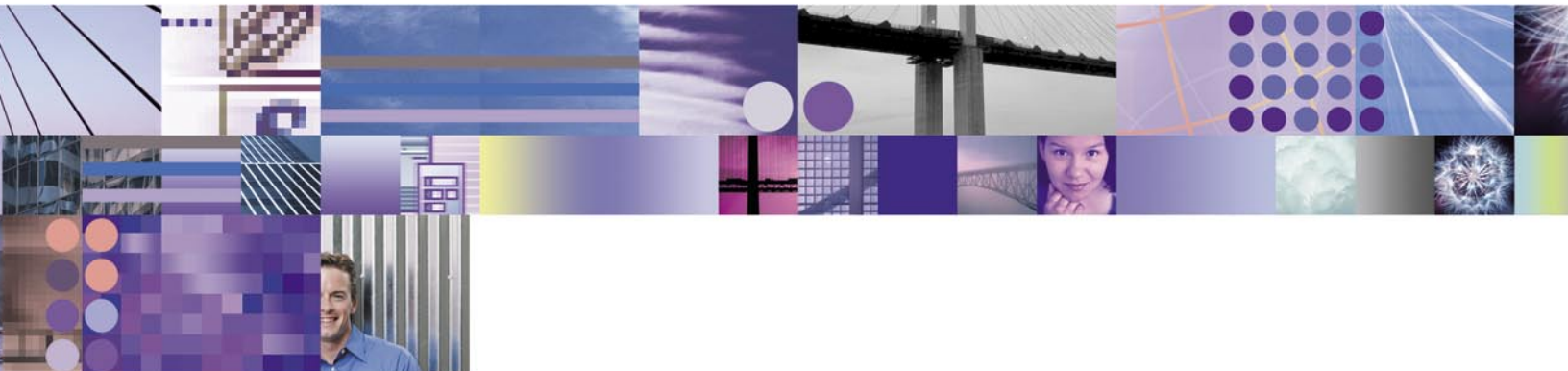
Drive technology, deliver opportunity

Telematics technologies from IBM provide more than a new set of features for your customers. They provide new profit centers, increased customer loyalty and a healthy return on investment. By leveraging IBM telematics solutions to keep you closer to your customers, the benefits are tangible:

Faster routes to innovation, at lower cost
Critical field data gained from vehicle sensors can be incorporated into the design and production processes in near real-time, allowing designers and engineers to identify existing product strengths and weaknesses — and discover quality problems more rapidly. It also allows you to develop new products and services that address specific, targeted needs for your customers, and without the guesswork. And it's all built on the architecture for a managed network, allowing you the scalability to support the vehicles, from hundreds to millions, under your own or third-party control.

Increased customer loyalty
By keeping the dialogue with your customers open, telematics technologies from IBM allow you to constantly keep connected to your customers. To offer new services. Improve the vehicle maintenance process. Demystify the car. Reinforce the brand image that your customers bought into at the time of purchase. And reinforce the brand image you want them to buy into with their next vehicle.

Improved safety and security
Telematics technologies that improve vehicle safety, emergency response times and reduce loss of life stand to benefit everyone. Insurance providers realize a savings in policy payouts. Medical personnel arriving at an accident scene can have crash and occupant information in advance. Automakers have an opportunity to initiate faster, more targeted recalls and significantly reduce costs. And, drivers can be better equipped to prevent accidents

themselves. Vehicle tracking systems, used to locate a stolen vehicle, could become a standard feature, helping to deter thefts and reduce insurance costs to the vehicle owner.

Service enhancement
Using remote diagnostics and on-site vehicle plug-ins, service retailers have the opportunity to maintain a closer relationship with their customers, immediately notify them of critical service requirements and market service incentives directly into the vehicle as a way to foster service loyalty. By helping drivers anticipate problems before they arise, telematics can help the service provider establish itself as the ultimate expert on the proper maintenance of the vehicle.

New revenue streams
Telematics solutions from IBM not only help you deliver the features and services your customers want, they allow you to stay competitive by reducing the time and costs required for your company to bring new offerings to market. Whether launching new features or upgrading existing ones, telematics give you the opportunity to enhance the driving experience for years after the sale, creating a new source of revenue from existing customers.

Evolve your business model smoothly
Beyond the technology, IBM offers the practical expertise to help you continue your transformation to e-business quickly and easily. That means helping you reach real profitability faster, with fewer headaches along the way. From consulting to hosting, IBM can help ensure your telematics offering is in sync with the rest of your business and your bottom line.

Managing the balance between gathering data and protecting privacy

Protecting user privacy is an important issue. As the number of technologies that enable the collection of customer data—including telematics—continues to increase, so do the number of questions about how to balance your need for data and your customers' needs for privacy. While legislation will dictate some of the answers, establishing privacy policies and standards for your customers will become an integral part of your brand.

With nearly 1000 security and privacy professional consultants around the world, this is familiar ground for IBM. Along with an enterprise-wide commitment to managing privacy issues and data practices, we've helped pioneer solutions that address these important questions. One answer is Privacy Manager software, which allows enterprises to manage data in accordance with the privacy and security policies assigned to it. Regardless of how complex a data-management task your company faces as privacy practices become more common, IBM can design a solution to satisfy your need for information and your customers' needs for privacy.

Our Business Partners and customers are already in the fast lane

IBM is successfully collaborating with a growing number of auto makers, suppliers and standards organizations to help give motorists more convenience and benefits through telematics technology. A sampling includes:

Suppliers and technology providers

ATX

Award-winning ATX Technologies has developed Interactive Voice Recognition/speech-response technology (IVR) to provide motorists with enhanced navigation, safety and convenience. The company has selected IBM ViaVoice and WebSphere Voice Response solutions as the foundation for IVR. ATX has developed the capability of telematics data connectivity between vehicles and wireless devices using IBM WebSphere Everyplace Server technology. In North America, ATX supports multiple auto makers in the delivery of telematics services to vehicle owners, and recently has entered the European marketplace.

Celestica

IBM and Celestica are delivering open-standard, high tech 'black box' devices. The new eDevices are built using the IBM automotive client architecture and software to enable deployment of tailored telematics solutions for consumer and commercial applications around the world.

Motorola

IBM and Motorola are dedicated to breaking new ground in the development of technology that helps automakers bring wireless and Web-based services to motorists. They will combine their technologies, products and services for a joint in-vehicle telematics systems approach to auto manufacturers.

LGElectronics

LGE will develop digital appliances for vehicles based on IBM embedded software and QNX real-time operating system. This portfolio will be used by automakers to create advanced telematics applications and services worldwide.
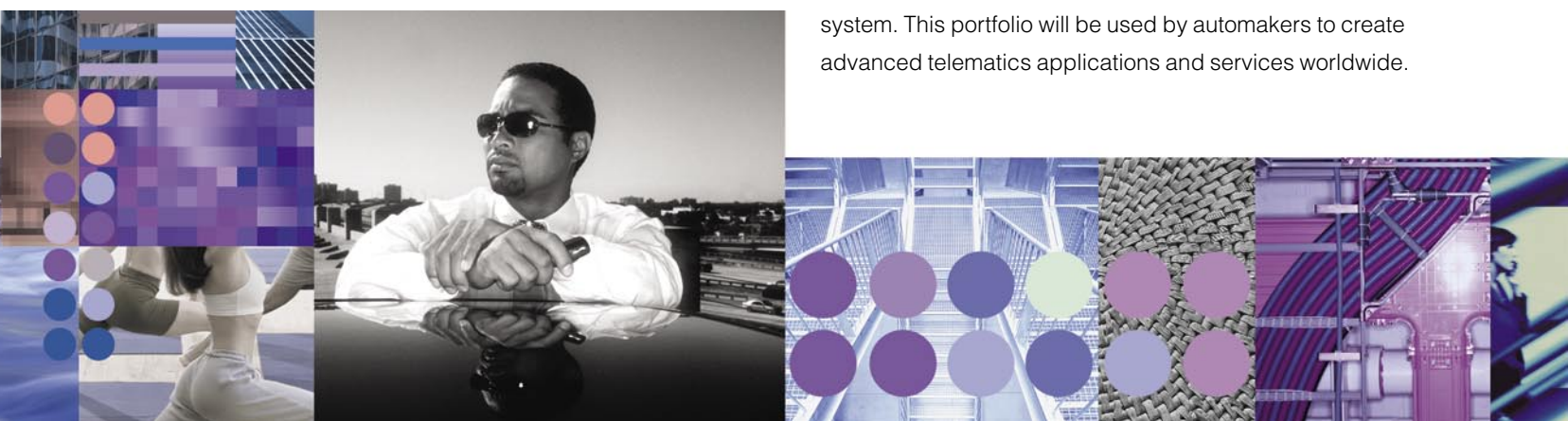
Johnson Controls

JCI offers a hands-free, voice recognition communications system, using IBM Embedded ViaVoice software that provides mobility for the customer to dial phone numbers or access their audio address books by speaking preprogrammed commands. Unlike competitive offerings, the system's communication is driven through the user's own wireless phone carrier.

Work on standardization

IBM ensures solutions for embedded systems are based on industry-wide open standards protecting customers' ability to choose, adapt their solutions as the market evolves and easily move their critical applications to other systems and device types. IBM is leading/working with standards bodies, such as OMA (Open Mobile Alliance), OSGi Alliance (OSGi Services Platform), VxML (Voice markup language), X+V (XHTML+Voice), Bluetooth and Java, to protect customers' solutions for future growth.

Automakers

Chrysler Group

IBM technology is helping to power an industry-first Vehicle Communications System. Working with Johnson Controls (JCI), Chrysler Group offers a hands-free, voice recognition communications system that, unlike competitive offerings, is delivered through a user's wireless phone and works inside and outside the vehicle.

General Motors OnStar

OnStar has upgraded its embedded hands-free voice recognition capabilities by collaborating with IBM to enhance our ViaVoice technology, allowing faster, more intuitive continuous digit dialing and improved voice recognition accuracy.

International Truck and Engine Corporation

International's fleet management solution includes their self designed in-vehicle device, a 2.5G wireless link (1xRTT), data routing services by WirelessCar, and an IBM-built portal based on WebSphere software that is deeply integrated with International's internal systems. IBM also helped develop the strategy and end-to-end system design.

Deliver the ultimate customer-centric offering

Connect with your customer and you can do amazing things. Build loyalty. Reduce costs. Increase profitability. Sharpen your competitive edge. With telematics solutions from IBM, you can take advantage of the new possibilities that wireless technologies offer today. And with our open-platform approach, easily incorporate the advances of tomorrow.

From the initial architecture to deployment, hosting and customer support, IBM has the end-to-end telematics expertise to help you keep the dialogue with your customers open. It can also provide measurable results and a better way to manage an ever-quickening lifestyle for your customers. With a continued focus on practical research, IBM has the industry leadership you can depend on to make the most of your telematics offerings.

For more information

Learn how end-to-end telematics solutions from IBM can benefit your organization at every stage of your business process. And keep your customers coming back for more.

For case studies and the latest updates about current telematics research from IBM and IBM Business Partners, visit IBM Telematics Solutions group today at: **ibm.com**/industries/telematics

Have a question? Contact the IBM Telematics Solutions group today for specific inquiries about how we can help you take advantage of our extensive industry expertise and forward-thinking technologies, at telematx.us.**ibm**.com

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