Smallworld™ Core

Designing and Managing the World's Infrastructure Networks

Utility and telecommunication network operators need powerful solutions to manage the lifecycle of their network assets for optimum performance and service availability. GE offers comprehensive solutions for end-to-end support of the business processes required to efficiently manage network infrastructures.

These innovative software solutions are based on GE's proven geospatial Smallworld Core platform. This market-proven product provides a powerful, consistent architecture at the heart of numerous network and asset management solutions, including planning and designing electric, water and gas transmission and distribution systems, designing telecommunications networks, and evaluating strategic market opportunities. The Smallworld network asset inventory at the center of these solutions manages an accurate, comprehensive and integrated geospatial view of the entire network with all its details and the full connectivity to model complex behavior, such as power flow in an electric network or a Fiber-To-The-Home communications network.

The Smallworld Core platform is based on common IT and geospatial standards and can be easily integrated with other business applications that require spatial information, including solutions for customer relationship management, operations management, market analysis, and work management. It is the foundation that underpins GE's leading-edge industry-focused Smallworld application suites for utilities and telecommunications. The global Smallworld customer list of more than 1,000 companies includes some of the largest electric, gas, and telecommunications operators around the world.

Core Strengths

Smallworld Core provides the foundation to manage the lifecycle of network assets, where geospatial data is a key role in satisfying business critical processes. Its capabilities form a comprehensive geospatial platform which manages complex infrastructure network inventories with the detail and connectivity to support key business processes throughout the asset lifecycle.

Built-in quality assurance tools ensure quality and consistency of network data through extensible business rules to enable a single source of truth for all network asset data throughout the enterprise. This intelligent network data can be easily accessed by everyone within the enterprise as well as by authorized partners and customers via the Internet.

Smallworld Core has been designed to truly scale with the needs of the largest network operators in the world with very large databases and thousands of users. It enables flexible integrations with other enterprise IT systems managing assets and provides operational support to realize the benefits of efficient end-to-end business processes.

It integrates network data from disparate data sources to transform diverse data into useful information to make better informed business decisions for operational processes and strategic planning.

An integrated development environment enables customers and their partners to efficiently build complementary applications and to adapt standards to specific business needs.

Customer Benefits

- Eliminate the need to maintain multiple databases with one consistent, up-to-date geospatial network inventory acting as one source of truth for accurate asset data to drive key business processes.

- Target functionality for efficient management of assets through the plan, design, build, and operate lifecycle.

- Reduce planning costs up to 20% and field rework up to 10% through more productive and accurate engineering processes.

- Increase productivity for as-built network updates by up to 15%.

- Scale to meet the largest organizations' needs, enabling staff to take advantage of geospatial asset data in their different roles.

- Reduce replacement investments by up to 30% through better informed, auditable asset management decisions that maximize asset utilization.

- Strong focus on open IT standards helps ensure that geospatial asset data is ready to integrate into the enterprise's key systems.

- Reduce time to deliver auditable reports from weeks to hours.

- Smallworld 5: Architected for the future with continued adoption of the latest technology standards that simplify system integration through open technologies; faster, smarter decisions through modern web and mobile technologies; and increased productivity through focus on a modern user experience.

imagination at work

EDEN
CONSULTING

Challenges Facing Today's Network Companies

Geospatial solutions have moved from a department application for network documentation to a critical success factor for asset management of complex infrastructure networks. Network operators need a geospatial platform that is capable of acting as the single source of truth for accurate spatial data describing their network.

The next generation of benefits that companies seek involves the cost-effective integration of spatial information with other operational and analytical systems using the standard approach of Service Oriented Architecture approach that their IT organizations require, streamlining these business processes and helping to create a more efficient, responsive, network operator.

Access to accurate geospatial data needs to be universal: within the network operator, to its partners and out to its customers. Data needs to be available on the desktop, on portable devices and through the web browser. New application devices present a different set of capabilities and opportunities, both in the back-office and in the field, that are setting the standard for modern and innovative user experiences. The increased access to this wealth of data has created a trend to spatially enable data warehouse solutions and extend business intelligence tools to perform analyses on the geospatially-linked information.
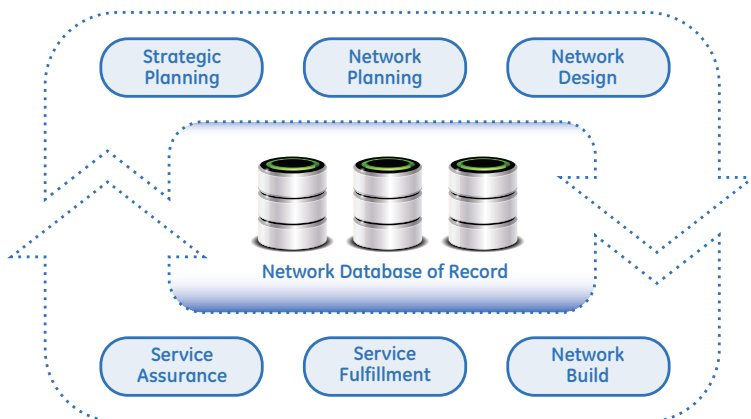
Addressing Business Challenges

GE offers a comprehensive portfolio of solutions that support the critical processes within the plan, design, build, operate and maintain lifecycle.

Strategic Planning

At an enterprise level, spatial information helps planners understand where new networks should be targeted, where additional investment is required to meet forecasted demand for capacity, and where business justification for investments in network upgrades is needed. In many countries, presentation quality maps are required to support these investment proposals to industry regulators. Smallworld GeoSpatial Analysis enables visualization of customer and market demographic data, network infrastructure footprint, service areas and finance data together to support evaluation of different strategies for proposed network investment plans. These plans are used to drive network upgrades and new build construction programs and provide high level timing and priorities.

Full Life-Cycle Support

Network Planning

At a regional and district level, planners need to understand the detail of the underground and overhead network assets and their relationship with new construction, other operated networks and public works to plan maintenance and network extensions.

Smallworld Core can model and represent the network in different spatial views, representing geographic, underground networks and assets within buildings, together with annotations of the existing and planned network in a single environment,

Network Design

Spatial information from a number of sources needs to be combined with the current network in a design environment where designers can lay out a number of solutions to a new service or maintenance work request. Smallworld Design Manager provides a geospatial-based design environment to manage the proposed network changes. Cost information for the proposed network changes can be used as part of the design approval within the spatial environment and this information shared with Enterprise Asset Management systems using Smallworld Business Integrator.

Network Build

To support construction crews building a network, accurate, annotated engineering maps of the planned assets need to be provided as part of the job packs issued to work crews. These maps are provided as paper or electronic documents or as data sent to field systems. Smallworld Core can provide the annotated paper and electronic drawings required.

Post construction, as-built information returned to the organization needs to be stored to accurately document the network as it has been constructed. Smallworld Core's quality management tools combined with manual or electronic updates submitted to the network inventory facilitate an up-to-date and consistent source of network data.

Network Operations

To support the go live switching of the network build, the planned view of the network model needs to be passed to other operational systems as a connected network model with geographic and schematic views. Additionally, some self-service applications need to be delivered from the enterprise through the Internet to contractors and customers, such as with GE's 'Call Before You Dig' and 'Network Status' applications, which are based on Smallworld web technology.

Network Maintenance

To understand and manage the impact of network maintenance on customers, an intelligent network model of the as-built network is needed. The Smallworld Core platform provides the full geospatial support for network maintenance needs: Smallworld GeoSpatial Analysis provides intelligent network modeling, presentation and analysis, and Smallworld Business Integrator provides seamless integration with enterprise work management systems.

The Smallworld Solution

The Smallworld Core portfolio is comprised of the following products:

Smallworld Core Spatial Technology is the foundation product, providing key capabilities for business solutions. Its geospatial data management capabilities are designed for deployment throughout distributed organizations, reaching all users who need to access and maintain the network asset inventory. Its database is highly scalable to handle very large networks while also modeling the detailed connectivity necessary for its advanced applications.

Smallworld Core Spatial Technology is designed around industry technology standards, enabling direct access to enterprise data from Oracle® and other data sources. For building complementary industry applications, it provides an integrated data modeling and application development environment.

Smallworld Design Manager accelerates the engineering planning and design process, with comprehensive workflow support and process control, design tools, and cost estimation, tuned for the needs of very large network operators.
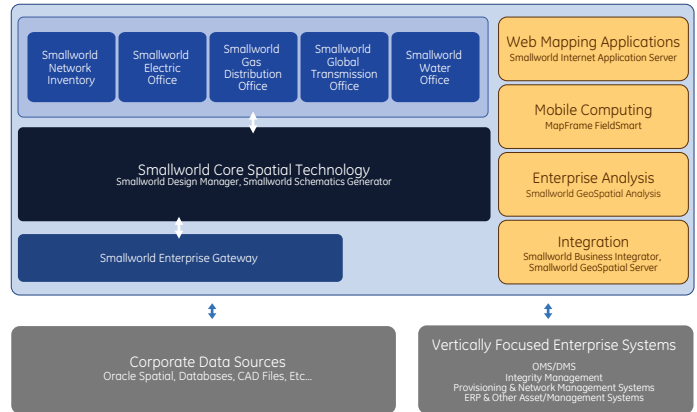
Smallworld Schematics Generator provides automatic generation and maintenance of schematic representations of the network to support a range of operational and planning business processes.

Smallworld Enterprise Gateway enables access to all network asset data throughout the organization. It synchronizes the data held in the Smallworld database with an enterprise Oracle database to leverage the value of the Smallworld data for other business processes.

Smallworld GeoSpatial Server provides access to geospatial data and functions as web-services to support service oriented integration with operational systems such as a Distribution Management System and provides OGC certified services. It reduces costs to create and maintain integrated enterprise IT solutions and provides the flexibility to respond to evolving business and regulatory requirements.
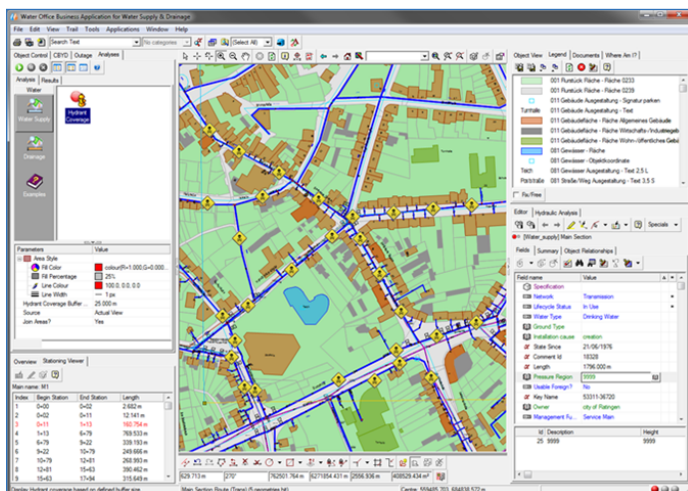
Smallworld Core Architecture

Smallworld Business Integrator enables integration with Enterprise Asset Management (EAM) systems, including a certified integration with SAP®. It supports the synchronization of common network asset data and seamless business processes based on Smallworld and EAM applications.
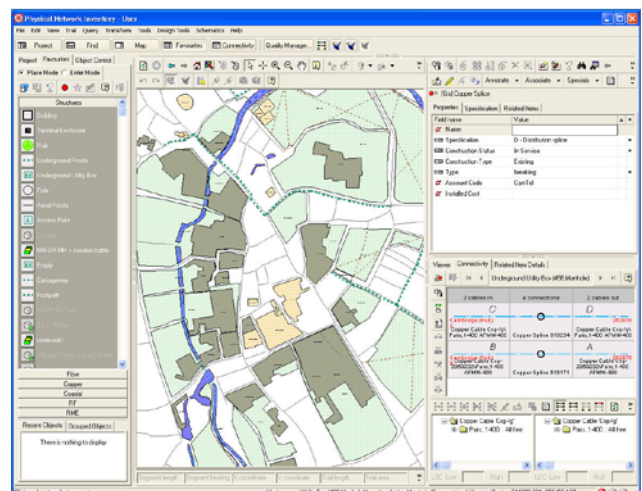
Web Mapping Applications provide easy access to network data and applications for anybody in the enterprise through the web for a wide range of business processes, including One Call/Call Before You Dig and Network Status applications.

Smallworld GeoSpatial Analysis is the spatial business intelligence application, which leverages geospatial and all other data sources for operational and strategic asset management processes. It enables a wide range of users to generate visualization-based analysis on combined enterprise and spatial data to meet a range of business needs, including meeting regulatory reporting requirements, monitoring key performance indicators, optimizing network investment strategies using the network data and providing input to marketing campaigns to grow the customer base.

Water Supply and Drainage Networks Managed Using Smallworld Water Office

Telecommunications Network Design Using Smallworld Physical Network Inventory
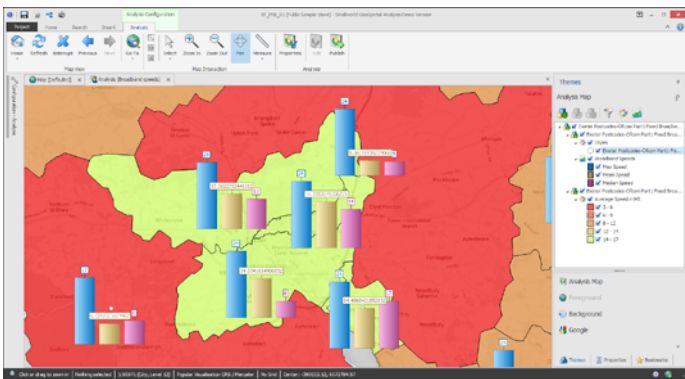
Delivering Business Value

Smallworld Core enables process efficiencies to be realized in many areas of the plan, design, build, operate and maintain lifecycle for your network assets.

Strategic Planning

Challenge: Strategic planners need to make informed decisions about where new network capacity is required or where to replace aging assets.

Solution: Smallworld GeoSpatial Analysis enables strategic planners to combine data from a variety of sources and analyze it in one environment.

Benefit: Through better utilization of existing network resources and by deferring non-critical investments, new build costs can be reduced by as much as 30%.

Telecommunications bandwidth analysis using Smallworld GeoSpatial Analysis

Network Planning

Challenge: Making the right decisions on which technology to use when delivering service to a particular network area has a significant impact on the overall cost of the network infrastructure.

Solution: Using the geospatial network data held in the Smallworld database, optimization engines can quickly compare network designs and technology choices.

Benefit: The right technology choice optimizes the number of reliably served customers for a given investment in the network. Operators using an integrated solution to optimize the high level network planning can use the network data to achieve savings.

Network Design

Challenge: Detailed network design must be completed quickly to avoid creating a bottleneck in delivering service to customers.

Solution: Smallworld Design Manager provides automated design functionality to quickly design the required network changes.

Benefit: Major operators rely upon their Smallworld solutions to undertake their network design and have seen an increase in productivity of around 20% for their network designers.

Network Build

Challenge: It is vital to ensure that the final as-built situation in the field is correctly reflected back in the inventory at the conclusion of the network build process.

Solution: An integrated solution with a field system provides construction crews with the ability to electronically update the designed network with the final as-built information.

Benefit: The automation of the as-built update process can result in productivity savings of up to 15% compared to manual updates.

Network Operations

Challenge: Current knowledge about the network must be readily available to the enterprise for day-to-day operational support and for customers to understand network status.

Solution: Web applications using Smallworld GeoSpatial Server provide direct access to network inventory, using secure role-based access to provide users the data and applications they need.

Benefit: Large operators provide access to thousands of users with hundreds of concurrent users able to access the network information they need, when they need it.

Network Maintenance

Challenge: Detailed network inventory data must be kept up-to-date so it is continuously available for maintenance decision making.

Solution: Smallworld Core provides vital data and functionality to enable efficient service assurance processes and to provide a consistent source of reliable data for maintenance activities.

Benefit: With access to accurate data and functionality to quickly locate network faults, network operators have reduced network downtime by up to 25%.

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