

PROMISE

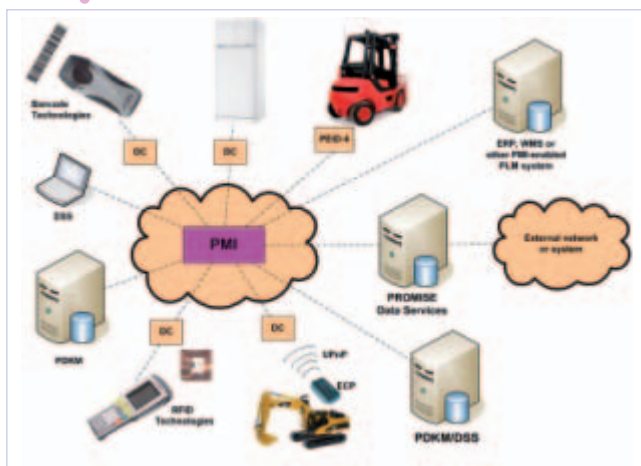
Scope

A car that can tell a mechanic what is wrong with it and keep salvageable parts from ending up on the scrap heap at the end of its life. A fridge that can automatically alert a repairman when it malfunctions. Or an industrial machine that can give advance warnings when parts are wearing out. Those are just a few examples of the wide range of applications for closed-loop Product Lifecycle Management (PLM) made possible by work carried out in the Promise project.

Using electronic tags, sensors, embedded computers and wireless or wired communications technologies, all kinds of products are able to exchange information with each other, with users, with servicers and with manufacturers. These products could be anywhere: in the home, in the factory, out on the road, etc.

This flow of information lets manufacturers continue to see how their products are functioning after they are in the hands of the customer. This allows manufacturers to provide better customer support, rapidly address design issues, and develop better products. Parts that need to be replaced become apparent immediately, while those that are still in good condition and can be reused are apparent at the end of a product's life.

Promise closes the information loop from the beginning through the middle to the end of a product's life. The architecture and technologies developed in the Promise project have enabled the transformation of product lifecycle information into valuable knowledge. This knowledge will give manufacturers and service providers a competitive edge, consumers better products and support, while helping preserve the environment through more efficient recycling and reuse.



Architecture concept

Advances

Promise developments go beyond the state-of-the-art in several respects:

- Innovative process and information flow models have been developed for all Promise components and each of the Promise demonstrators.
- A new PLM ICT infrastructure has been developed following the Promise architecture.
- New business models have been produced that allow industrial organisations to evaluate the business benefits of the innovative Promise technologies, and to test new business ideas.

Breakthrough: The Promise System Architecture

The Promise architecture provides a secure infrastructure for the collection, exchange and processing of product lifecycle management data throughout all lifecycle phases. In particular, it improves the accessibility and usability of data during the middle-of-life (MOL) and end-of-life (EOL) phases. It defines standards, interfaces and components that allow the creation of a Promise implementation in a flexible and reliable manner.

The Promise architecture supports the development of innovative, new technology components. It also allows the integration of existing technologies and systems to form a consolidated infrastructure. It has been designed to support and encourage the flow of lifecycle data between multiple enterprises throughout the life of a product and its components.

Promise has implemented integrated solutions in 10 real-world demonstrators that cover a broad range of industrial domains, such as automotive, railway industry, white goods, and brown goods.

Closing the product lifecycle information loop has the following advantages:

- producers can be provided with complete data about the modes of use and conditions of decommissioning and disposal of their products.
- service and maintenance specialists can make better informed decisions thanks to complete and current information about the product's status and real-time assistance and advice over the internet.
- recyclers/reusers are able to obtain accurate information about the residual value of materials at EOL and make informed decisions.
- designers can improve product designs and meet product lifecycle quality goals by exploiting expertise and know-how of other actors in the product's lifecycle.

Positioning in global context

New services and improvements made possible with Promise include:

- Innovative products and services that go far beyond competitor offerings, and are difficult for less-skilled competitors to copy.
- Improved customer relationship management based on up-to-date real-life product data.
- Simplified product authentication, enhancement of product and user security and safety.
- New types of product leasing and insurance services.
- Improved maintenance and service at reduced cost.

Promise Innovation International Ltd.

The commercial company “Promise Innovation International Ltd.” is founded to deliver services and products related to the gathering of lifecycle information and decision support functionality by closing the information loop and communicating across all phases of life. Promise Innovation International Ltd. will guide and assist its clients to develop products and business processes which benefit their industry, customers and the environment.

Contribution to standardization and interoperability issues

The Promise project aimed to influence and contribute to Product Lifecycle Management standards. The project has taken great care to take advantage of existing standards and avoid duplication of standards or creation of competitive standards.

Two candidates for standards submission have been identified:

- The Promise Messaging Interface, and
- The Promise Product Data and Knowledge Management (PDKM) System Object Model.

The Promise consortium actively pursued the promotion of these candidate standards during the project. This work is intended to be continued by Promise-Innovation’s European Centre of Excellence for Closed-loop Lifecycle Management, which is being established to further the results of Promise. This promotional work includes active discussion with organisations including the Open Group, the British Standards Institute (BSI), and the European Committee for Standardization (CEN). Work is also in progress through contacts with the OASIS Product Life Cycle Support (PLCS) and STEP working groups to find the optimum relationship between the PDKM System Object Model and those existing ISO standards.



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Target users / sectors in business and society

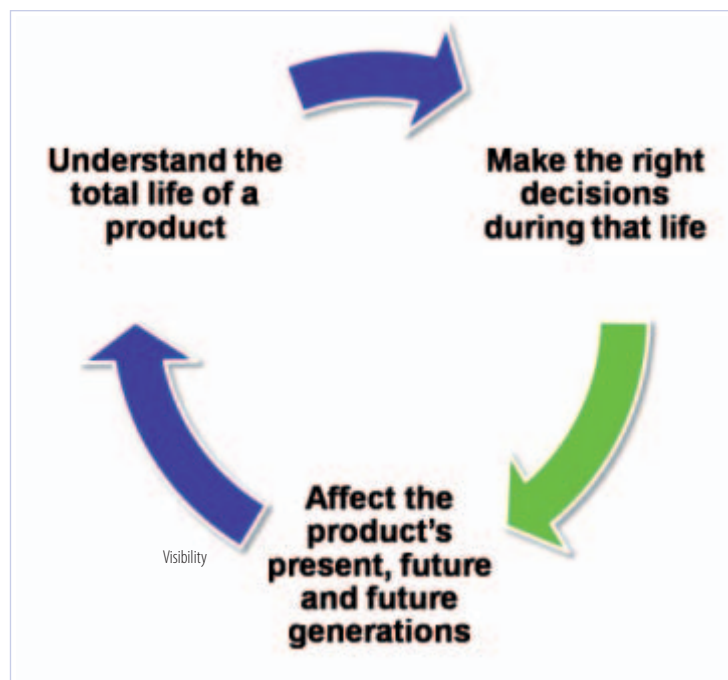
Closing the information loop creates benefits for many participants in the product lifecycle:

- Customers get better products and services
- Manufacturers get more information about the conditions and modes of product use and disposal
- Service engineers get up-to-date information about the status of the product and its parts
- Product developers use real-life experience with previous products to improve future products, reduce over-engineering and achieve lifecycle quality goals
- Recyclers get complete information about the EOL value of products, parts and materials
- Policy makers are able to ensure regulations are adhered to

Overall benefits for business and society

Promise may be regarded as an extension of the Internet and enables the realisation of item attendant ICT. Here, a data carrier in the form of an attendant physical entity is attached to or incorporated in a product or an item. The data carrier could be used to provide an identity, typically in the form of a machine-readable number as is used with Radio Frequency Identification (RFID), or any other information about the product/item. This approach contributes to achieving the Internet of Things.

Business and society can benefit in the medium to long term using the Promise technologies to collect, exchange, and process lifecycle information. Promise technologies have the potential to significantly impact process improvements in information accessibility in general. Ultimately, competitiveness, regulatory compliance, environmental objectives of sustainability and quality of life in general are improved.



Examples of use

Promise allows all actors that play a role during the lifecycle of a product (managers, designers, service and maintenance operators, recyclers, etc.) to track, manage, and control product information, at any time in any phase of its lifecycle (design, manufacturing, MOL, EOL). Promise results and technologies have been applied to a wide range of applications including:

- Design for X
- Sustainable manufacturing and services processes
- Tracking and tracing
- Logistics and reverse logistics
- Item specific recall management
- Remanufacturing and decommissioning
- Recycling and landfill reduction

A car manufacturer could, for example, use feedback from its vehicles to improve component design at the beginning of life. In the vehicle's middle-of-life phase, when it is used by a customer, information about wear and tear on components could be used by mechanics during servicing to rapidly determine what parts need replacing. This will improve maintenance and safety. When the vehicle is retired at the end of its life, components that are still in good condition could be identified and salvaged for reuse, thereby helping to protect the environment and reducing costs and waste for manufacturers.

Achievements

- Promise architecture,
- PMI - Promise Messaging Interface,
- CorePAC for Product Embedded Information Devices (PEID),
- SOM - System Object Model

All achievements are in draft form and subject to pursued standardisation efforts

www.promise-plm.com

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title

Product lifecycle management and information tracking using smart embedded systems

contract number

507100

type of project

Integrated Project

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project website and partner list

<http://www.promise.no/>

EC contribution

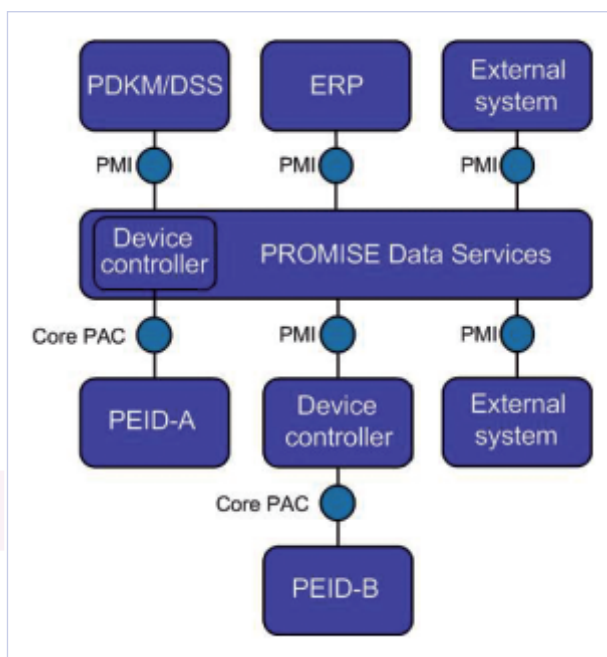
7 999 970 €

start date

15/11/2004

duration

42



Architecture diagram