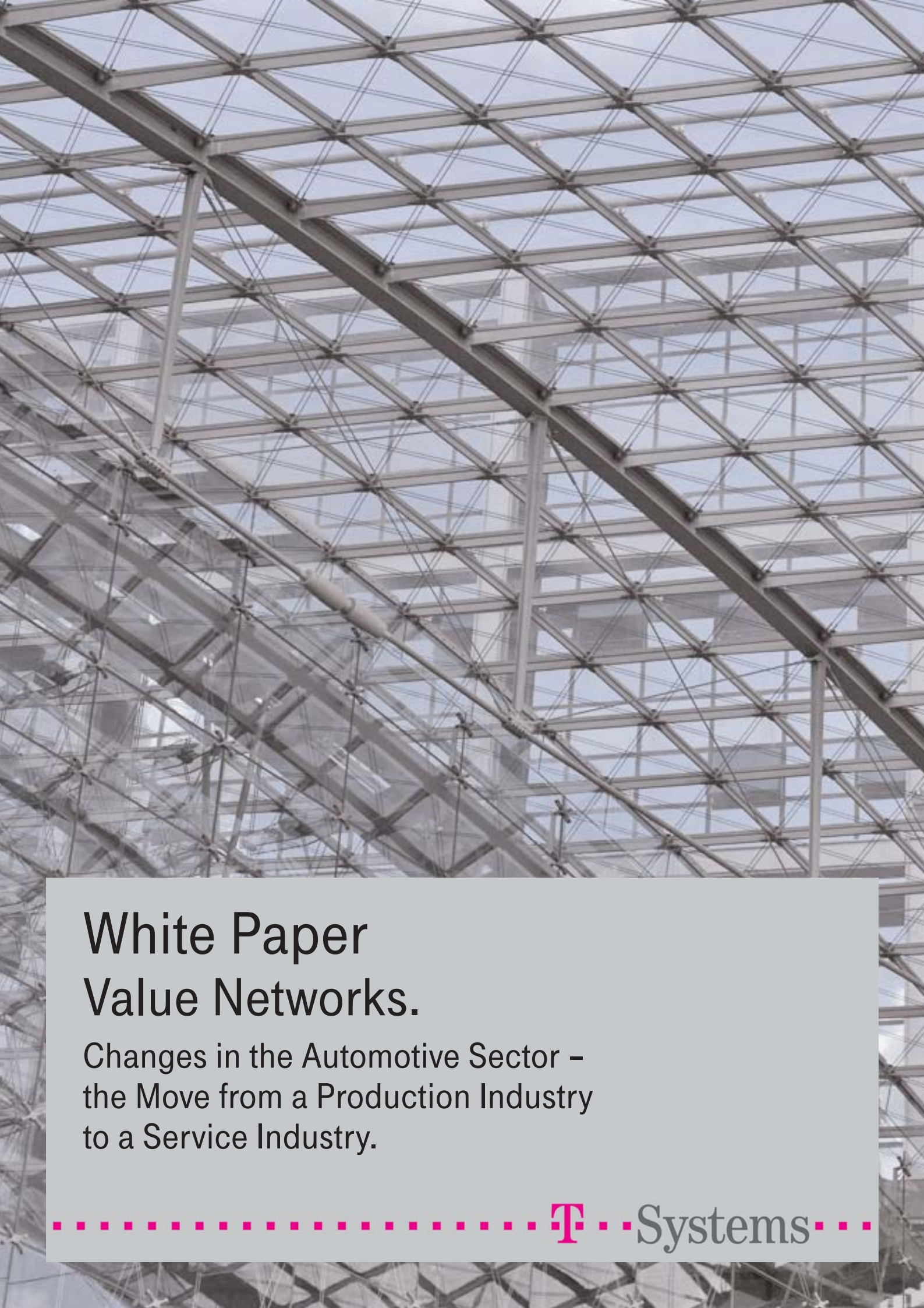

White Paper
Value Networks.

Changes in the Automotive Sector –
the Move from a Production Industry
to a Service Industry.

T Systems

Contents at a glance.

1. Players and trends in the automobile market.

The automotive sector has always been characterized by change and new directions, never more so than in the last twenty years. Cut-throat competition and numerous takeovers have drastically reduced the number of providers. From an original figure of 500 independent automobile manufacturers worldwide in 1910, only thirteen remain almost one hundred years later.

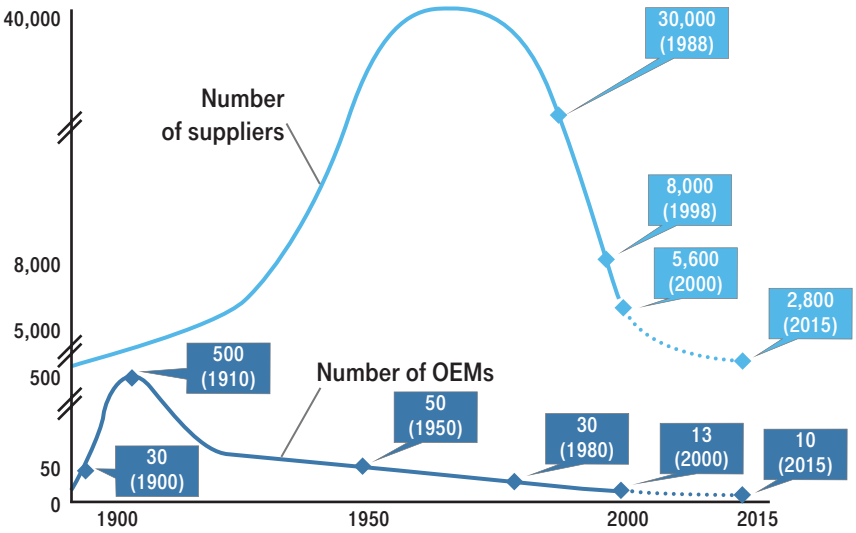

Figure 1: Consolidation among OEMs and suppliers (Source: Mercer Management Consulting).

There is a much greater variety evident in the area of supplier businesses. However, here too the trend is towards a decline in the absolute number of supplier businesses, so that only the fittest survive. There are even signs of consolidation in the automobile retailing sector. Dealership networks are becoming tighter and leaner.
This is mainly for two reasons: the enormous cost pressures to which the industry is prey, and the shorter development and production times demanded by the customer. Manufacturers respond by concentrating on their core competences, on the one hand, while also increasingly focusing on customer expectations on the other.
The manufacturers' core areas of expertise include a number of areas are key in shaping a brand image. These have always included Development, Production, Integration and Assembly. These constitute internal services on the part of the manufacturers. However, because of the high level of fixed costs associated with them, these activities are becoming less and less attractive. Thus, in future, technological innovation will be the element that will differentiate between products. For the manufacturers this means developing new core areas of expertise, e.g. specific service offers.

Customer expectations are increasingly taking center stage.

Contact with the customer and familiarity with his requirements will be the critical success factors for the future. The automotive sector is undergoing a change that is reflected in the extent to which manufacturers are seeking to fulfill the expectations of their customers: They are moving from a production industry to a service industry.

For some time now, OEMs (Original Equipment Manufacturers) have been investing heavily in their own sales organizations and additional services in a move to find new sources of added value and new market shares. The range of services offered by manufacturers can be divided into vehicle-related and non-vehicle related services. The vehicle-related services include complementary services such as mobility packages, fleet management or information and telecommunications services. These services are tailored to the car brand. Non-vehicle-related services include vehicle rental, ticket service, traffic services and route recommendations or pick up and drop off service.

In addition, many car manufacturers are taking the step of establishing full service centers where their customers can be offered extensive packages. Some OEMs believe it highly likely that in the future customers will prefer to use several different cars for demand-oriented tasks, rather than having just one car of their own.

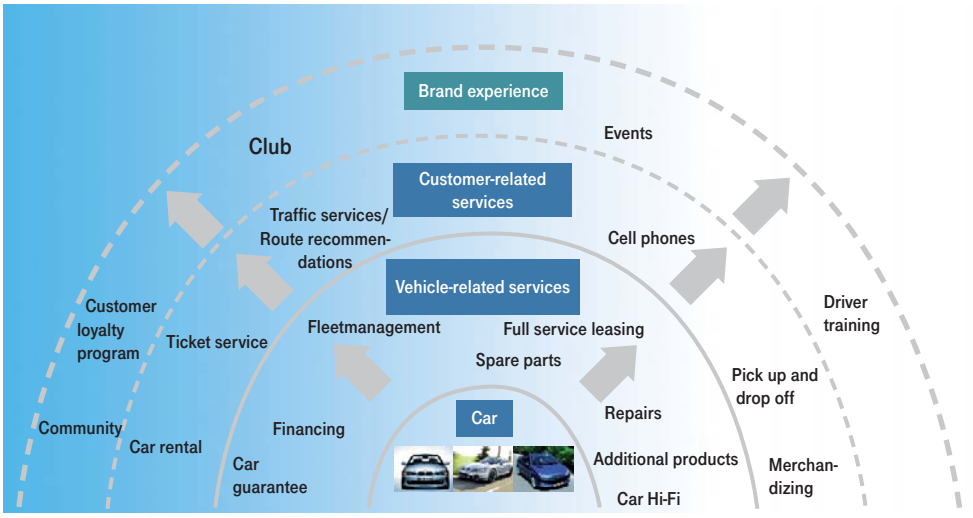

Figure 2: Downstream Services – vehicle- and customer-related services (Source: MYCAREVENT 2006).

But what happens in the areas that are not part of the OEMs' core competencies? There is evidence of a move towards outsourcing: added value elements that are not intrinsic to the brand are delegated by vehicle manufacturers to their suppliers. The German Association of the Automotive Industry (VDA) currently assumes that, by 2010, suppliers will account for around 80% of the added value and 50% of development effort. As a result of this change, automobiles are no longer produced in a single region, but may, in some cases, be developed and produced on three different continents. Such cross-company networks make huge demands on those involved in terms of cooperation and coordination. In concrete terms this means that partners no longer provide their services within a value chain on an independent basis, but that they must mesh effectively with each other and work towards a common goal. What counts is not just optimum performance from a partner, but also from the entire network. A global perspective on the entire network makes it possible to meet the customer with competitive services and prices. In addition to the technological expertise of all the parties involved, the success of such networks crucially depends on a high level of mutual trust, based on fair dealing between the businesses. But how specifically can costs be reduced, while at the same time improving and expanding services for customers? Quality standards mean that savings on material costs are almost impossible. Greater room to maneuver means that scaling effects can be exploited in relation to order volumes or the interplay of the individual processes along the value chain can be optimized. Thus, for example, warehousing costs can be minimized if coordination with the supplier is improved. This is already the case with Just-In-Time production (see section 3.3.3 Just-In-Time and Just-In-Sequence solutions). Both of these require excellent organization and coordination between upstream and downstream links in the value chain if costs are to be reduced and services are to be expanded.

But this is precisely what is lacking: Coordination and cooperation between partners often leaves a lot to be desired and communications are frequently inadequate. Although many companies have already optimized their processes internally, the major challenge is to organize cross-company processes to the best possible effect. One way to do this is collaborative engineering, which is already an integral part of some value chains (see Fig. 3).

Collaborative engineering can take place in a relationship between an OEM and a supplier or between an OEM and multiple suppliers. Problems encountered in collaborative engineering in the past included both technical difficulties in implementation, as well as the opportunistic attitude of individual protagonists in relation to their partners in the network.

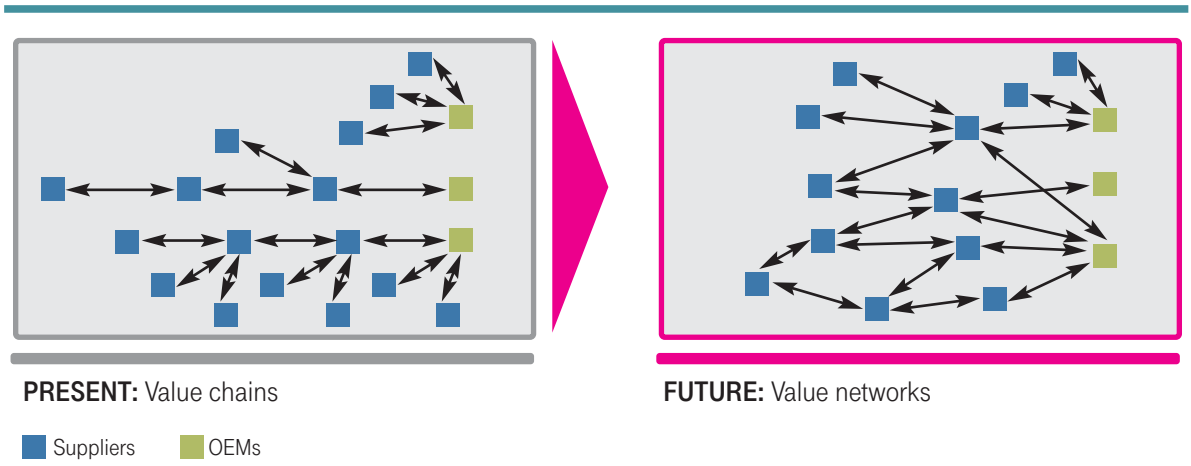

Figure 3: T-Systems, 2007: Changes to the value system require a new kind of collaboration.

However, this does not just affect the way in which partners collaborate within a value chain because the chains themselves are also changing. If one looks at current value chains between companies, it is evident that they mostly involve vertical integration across the various supplier levels (OEM, tier 1, tier 2, ...tier n). These vertical chains are increasingly being integrated in value networks. Value networks also take account of horizontal integration along the engineering, production, assembly, distribution, sales and service business processes. Data is exchanged and potential for optimization is realized, transcending the boundaries of individual businesses.

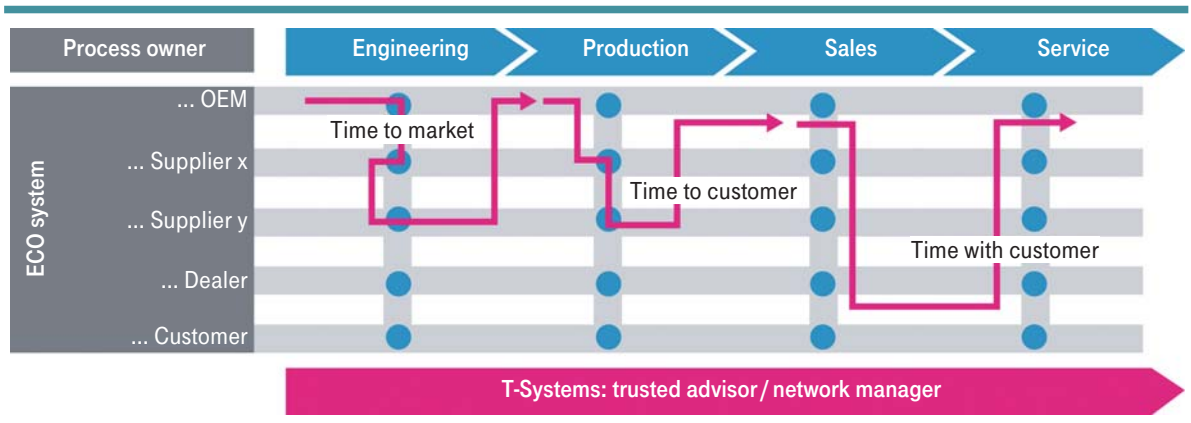

Figure 4: T-Systems, 2007: From value chains to value networks. The challenges.

2. Specific areas for successfully establishing value networks.

Activity is required in six areas if a value network is to be organized effectively and efficiently:

- Collaboration
- Integration
- Standardization
- Acceleration
- Flexibility/Mobility
- Technology

2.1 Collaboration.
Collaboration between partners in automotive value networks must attain a new quality. Links are required between business processes, applications and human resources that go far beyond the previous level of collaboration between car manufacturers, their suppliers and the dealers and importers.

	Present	Future
1. Innovation	■ Mainly bilateral solutions ■ No special incentive for innovations ■ Business-specific improvement	■ Networked solutions ■ Incentives for innovations ■ Cross-company improvements
2. Management and communication	■ Business-specific value strategies ■ Extremely individual processes ■ Communications based on commitment ■ Hierarchical collaboration	■ Integrated value strategies/ coordinated and complementary areas of expertise ■ Integrated processes ■ Intensive communication based in trust ■ Full networking and integration of specialist knowledge
3. Access	■ Local/business-specific standards ■ Independent business planning and controls ■ Independent resources and investments ■ Informal collaboration	■ Shared targeting and escalation processes based on uniform standards ■ Integrated business planning and controls ■ Shared resources and investments ■ Intensive collaboration
4. Risk	■ Profits maximized in the short term ■ Simple contractual regulation of the exchange of information	■ Shared profit and risk ■ Contracts to secure intellectual property

Figure 5: Paradigm shift in collaboration (Source: Berret 2006, p. 95).

According to Mercer Management Consulting, innovative forms of collaboration enable between € 600 and € 1,000 to be saved on every vehicle produced. Car manufacturers and suppliers can increase their EBIT margin by about three percent and return on capital employed (ROCE) by between four and ten percent.

However, a number of structural and cultural obstacles must first be overcome:

- The traditional customer-supplier relationship built up over many years was based on the unchallenged supremacy of the OEM. However, the new forms of collaboration require transparency. Many suppliers fear that transparency renders them vulnerable and OEMs are often economical with the information they pass on to their suppliers.

- Suppliers fear, often with justification, that their rationalization efforts will immediately lead to price reductions. This is one of the main reasons why optimization takes place behind closed doors.

- Dispatch managers have years of experience in exerting pressure so as to bring in the required volume on the required date. Disruptions lead to even more pressure on both sides.

- OEMs already require that suppliers should be familiar with their IT systems. However, the large number of different systems results in considerable expense for suppliers that they can hardly pass on to their customers.

- A shared approach to planning also means considering possible bottlenecks and moving away from rigid requirements.

These problems must be resolved in order to achieve improved levels of collaboration.

All network suppliers must act with foresight within the network.

OEMs and suppliers within the network should act with foresight and avoid supply problems instead of simply reacting to them. There are four significant major aspects here:

- long-term partnerships,
- collaboration and cooperation in development on several levels,
- cooperation and simultaneous competition (coopetition) and
- transparency in development and planning.

To ensure that all those involved always consider the benefits to the value network as a whole and not just to themselves, it is also necessary to develop new models for sharing profit and risk between the network partners.

2.2 Integration.

The aim of cooperative partnerships and cross-company networks is to break down the barriers between processes and systems. Previous and subsequent departments are already included in planning in current value chains. This trend is set to increase in future, requiring the establishment of new areas of expertise both among staff on the supplier and manufacturer sides and among dealers and importers.

The OEMs and many large supplier businesses have individual systems that define the principles and methods of the best possible working practices within the company. These would facilitate a dramatic increase in efficiency, particularly in Production, but also in Development. The next step is to integrate these systems in a general value system, so that not only is a high level of efficiency achieved internally within the various companies, but maximum effectiveness is also attained for the network as a whole.

Container management is a good example of this. To ensure that individual parts, such as fenders, tires or interior components can be moved around the factory floor and to the assembly line, large supplier companies must have absolute control over cycles consisting of several hundred individual containers. Many of these containers are special designs that are incompatible with other systems. This requires a great deal of effort from all those involved. Large suppliers (tier 1) and OEMs have therefore begun to create closed cycles of reusable containers and have started to use containers that can be used in several different systems. This integration results in cost reductions that benefit the entire network. The cross-company standardization of containers also simplifies automatic identification, e.g. by means of Radio Frequency Identification (RFID).

2.3 Standardization.

Increasing customer demands cause the number of variants to rise. Large numbers are harder to coordinate and increase the complexity of processes. This can only be counteracted if similar elements and procedures are coordinated with one another once again. The ability to standardize components, processes and systems will be a critical success factor in value networks. Standardization can affect both the product and the process.

Despite increases in configuration options, component diversity can be limited if the carry over parts are used in several different models.

Large numbers of parts and variants are the greatest challenge at product level. The reason for this is the variety of selection and combination options available when equipping new cars. The effort involved can be limited if the same parts are used in all models. Components can be standardized within a modular vehicle architecture and used in several vehicle models or segments.

Some car manufacturers have already introduced modular vehicle architecture. Components, for example in the engine or gearbox, can be used in different segments of the same vehicle brand. It is even possible to use the same component in models of different brands within a consolidated group. Some car manufacturers from different groups have already come together with their suppliers to develop vehicles, large portions of which consist of the same modules.

The increasing numbers of variants is also impacting on the area of spare parts supply. In order to avoid complexity and costs, standardization must begin in the early phases of the lifecycle.

Greater complexity is also evident at process level. As in many manufactured goods sectors, it is also possible for the automotive industry to achieve growth through internationalization and global orientation. Many automotive suppliers already operate factories in different parts of Europe. Production involves an international network of factories operating with complex logistical structures. For such a network to function, the internal processes must be stable and robust. Unstable processes, even between a small number of partners, can threaten the entire factory network. If this impacts on the ability of the supplier to deliver, the whole value network can be unbalanced.

To prevent this, value processes must be systematized and standardized. The definition, control and application of worldwide process standards are essential for a fully functional value network. The advantage of international standards is that they permit scaling effects. Productivity is easier to monitor and quality remains consistent.

To date, many companies in the automotive industry have focused on standardizing internal business processes along the length of the supply chain. This standardization must now be extended to encompass the processes from supplier to end customer. It is not only the required paradigm shift in behavior that is important, but also the challenges to be met at a technical level, such as the standardization of IT. System interfaces are to be coordinated and cross-company expertise is to be established.

The large number of variants must also be controlled in Production and Logistics, as this pushes up costs to a huge degree. Sales and Engineering are mostly responsible for component diversity. Thus, standardization must begin in the early phases of the lifecycle and must be put into consistent practice even by Sales. The aim must be to analyze the variants, to evaluate them in economic terms and only to manage the profitable variants. This means that potential savings can also be achieved in spare parts logistics.

2.4 Acceleration.

In recent years the lead times for cars have been radically reduced. This was made possible by greater efficiency in the supply chain. However there is still considerable potential for improvement in the time required for development – particularly among German manufacturers. In recent years, OEMs have mainly concentrated on the early phase of development. It is possible to reduce the effort expended by 30% in Preliminary Development alone. This means that the duration of a typical product provisioning process can be reduced from a current 60 months to 40 months.

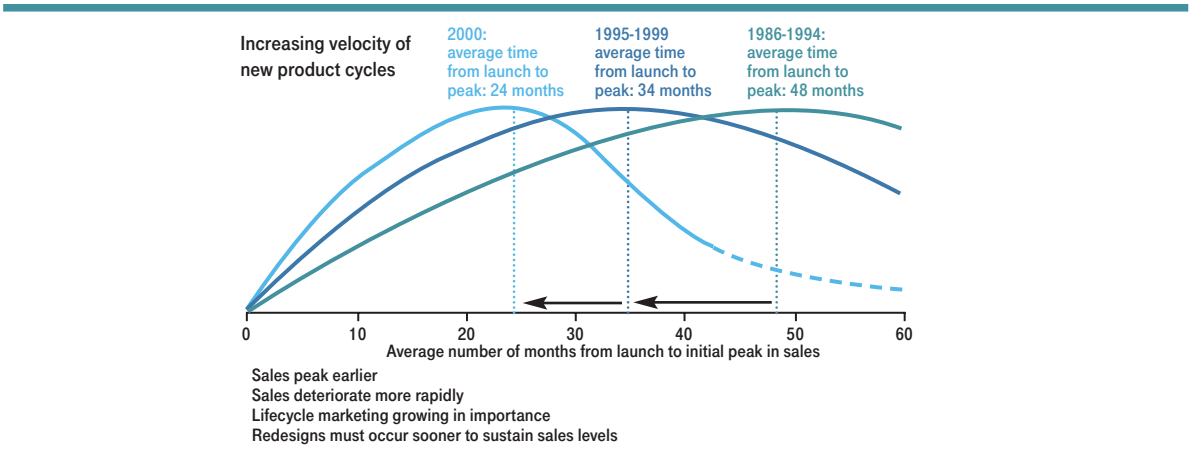

Figure 6: Reducing development times (source: Wards Automotive, Accenture analysis).

Making development processes faster and more rational demands a high degree of maturity in the early phases of vehicle development. Digital applications, such as frontloading, solutions for product data management (PDM) and simulation techniques are used here.

The aim of frontloading is to avoid problems or resolve them at an early stage by bringing forward the solution processes. This will succeed if integral product and process simulation tools are used and virtual analyses and simulations are performed. At the same time, product and process development are organized to run in parallel. All participants, whether manufacturers, suppliers or customers, are included. In the early phases, product and process knowledge must be developed and integrated in a comprehensive, reliable digital model in which CAD data is contained in a standardized form. Although frontloading increases the work required in the early phases of development, it simplifies the overall development process in the long term. The benefits are shorter development times, greater performance, greater maturity in development and reduced costs.

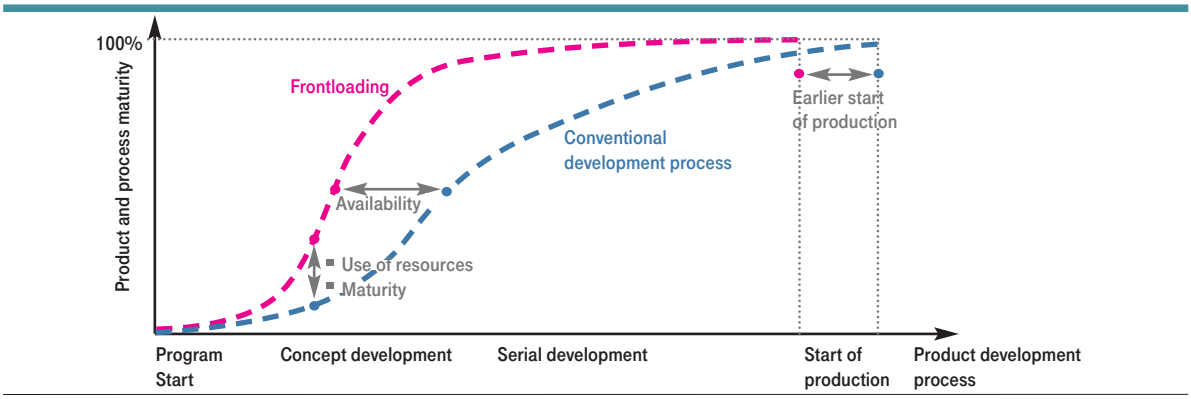

Figure 7: T-Systems 2007: Frontloading in the product provisioning process.

The introduction of PLM systems marked the start of competition between CAD, PDM and ERP systems in relation to the ownership of the data. The PLM system establishes relationships with neighboring components, other representational forms (FEM, CAM, CAx), Logistics or other internal processes. Economical and transparent product data management is gaining in importance because the various elements of a car are increasingly being developed in different places and at different times.

Concepts such as the five-day car, which can be produced and delivered within five days of an order being placed, underline the potential for saving time. However, this requires that order and inventory buffers should be eliminated. This also includes excess capacity in Production. Although excess capacity permits flexible management of production volumes, it drives up costs. One alternative is to organize the processes as intelligently as possible and to move variant diversity to the end of the processes. Diversity is limited at the start of the process by using carry over parts.

2.5 Flexibility and mobility.

OEMs and suppliers now need to respond quickly to changes in customer requirements and changing boundary conditions, e.g. in legislation. The benefits of new production locations must also influence added value in the network as quickly as possible. These targets can only be achieved efficiently if the entire value network is involved in the optimization processes. Thus, the partners in the value network must collaborate more closely in their cross–company logistics relationships. This is a challenge for manufacturers and suppliers alike. The trend is towards highly economical, adaptive businesses that are integrated in the new network structures and that are able to respond extremely effectively in different timeframes and on all business levels. All participants must be more flexible if an adaptive value network is to be developed. Resources in Production must become more flexible because many of the customer's requirements primarily affect assembly. However, for cost reasons many assembly systems are highly automated, making them very inflexible. Solutions on system level allow a much higher degree of flexibility.

However, simply making the machines used in assembly more flexible is not enough. The entire value chain for a factory must be defined on the basis of the problem flow, which includes the supply concepts with the required components. In concrete terms this means breaking down the entire production system into its constituent components: production units, logistics units and material flow principles. A modular factory library will be created that allows different modules to be combined. The emphasis is on new, flexible logistics concepts and methods for supply planning, however concepts for production logistics and warehouse concepts and methods are also developed in this way.

An integrated descriptive language for production systems can serve as a common standard for the various tiers of the factory. Furthermore, organizational concepts for highly flexible productions and adaptive factory layouts are to be designed and implemented.

Finally, the flow of information must be made more flexible along the length of the supply chain. Until now, isolated solutions have existed in many value networks, so that improvements can often only be made at local level. A participant in a value network is very dependent on his partners. If they are not supplied with the right information, the result will be long lead times and additional costs. To avoid this, work is required to optimize the entire network.

2.6 Technology.
Business processes cannot be carried out efficiently without the use of high-performance IT. This is why IT is also referred to as an enabler.

In the development process it is very important to be very familiar with the product data, to document it and to supply it to Production in the form of a specification. The aim must be to enable the relevant departments to access the data for the entire lifecycle of the product. This is the only way to integrate development data in all processes. This requires a comprehensive understanding of the complexity of modern product development processes and of the approaches to a solution in the PLM systems.

Until now, Production and Logistics have been associated with non-intelligent material flow objects (e.g. raw materials, auxiliary supplies or components). This resulted in extremely complex systems that were used to manage, plan and control logistical processes and to register the state of the objects. In future it will be possible to use Radio Frequency Identification (RFID) to identify each individual material flow object, thus rendering objects "intelligent". Objects will know their origin and destination and will provide information about their history and future. Outgoing and incoming goods can be identified correctly at any time using RFID. If products are equipped with RFID, they can gather and store information throughout their lifecycle. In addition, RFID technology can also be used to pinpoint containers.

The cross-company networking of IT requires new, flexible technologies.

The cross-company networking of IT requires new, flexible technologies. This was recognized at an early stage in the market and the principle of service-oriented architecture (SOA) was founded. The aim of SOA is to provide the best possible support for business processes with ICT solutions. Such solutions are no longer developed and run as a monolithic block, but are comprised of loosely connected services (e.g. small software modules). Because these services are called off in a defined sequence and exchange data by means of defined interfaces, business processes are mapped in the CRM, ERP and SCM systems. The result is an ICT environment that can be adapted with ease to meet new requirements. This is reusable and can have a distributed installation beyond business boundaries. As one of the leading providers, SAP has used SOA to achieve greater flexibility and compatibility. SAP Enterprise SOA unites the businesses processes of SAP with the SAP NetWeaver open technology platform. This means that services from SAP and non-SAP systems can be integrated quickly, simply and flexibly.

3. Approach for value networks.

3.1 Strategies for generating added value throughout the value process by intensifying cross-company cooperation.

A number of solutions already exist for supporting OEMs, suppliers, dealers and importers in meeting the challenges described in chapter 2. A structured procedural model helps in organizing networked value added services to meet specific requirements.

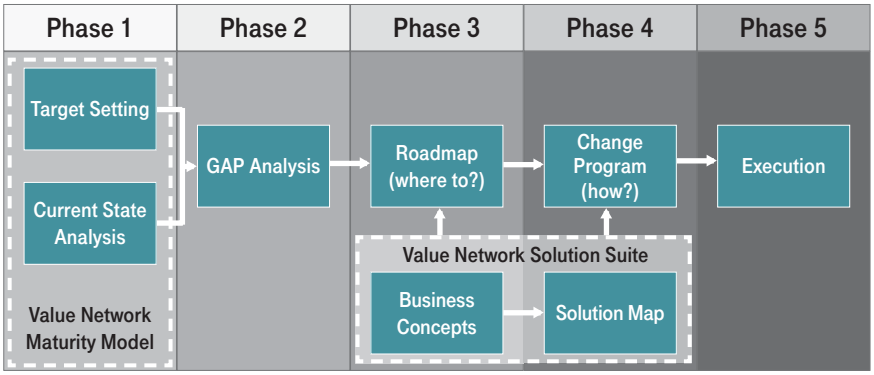

Figure 8: T-Systems, 2007: Procedural model for value networks.

- In the first phase, the value network maturity model (see Fig. 10) is used to determine the level of maturity the network is aiming for. The specific business type, situation and corporate strategy are taken into account. In this case it is important to be familiar with the best practices in the relevant industry. The actual maturity of the current business processes is also determined in phase 1.
- Phase 2 involves a process-specific comparison of the actual maturity with the target maturity, indicating the need for action in relation to networked added value.
- Phase 3 makes this procedure more specific. A roadmap is produced that embeds the objective in a schedule and that defines intermediate steps. The need for action is defined in six areas: collaboration, integration, standardization, acceleration, flexibility/mobility and technology (chapter 2). The effort involved in the changes and the benefits to be derived from them are weighed up.
- The aim of phase 4 is to produce a specific program (projects, schedule, organization, resources). The available solutions form the basis for this (see section 3.2).
- Finally, the program is implemented in phase 5.

T-Systems has developed a model specially tailored to the automotive industry on the basis of CMMI®.

The function of maturity models is to determine the quality of product development processes in organizations. The strengths and weaknesses of processes are analyzed as objectively as possible and assigned a maturity level. The model indicates specific improvements for every maturity level. The established standard is Capability Maturity Model Integration® (CMMI®).

The aim of CMMI® is to facilitate continuous process improvements. However it does not define a sample development process, but rather outlines requirements for professional product development organization. For this reason, CMMI® can be applied to organizations of different types and sizes. The model is also frequently used in the automotive industry.

T-Systems has developed a five-stage maturity model specially for the automotive industry on the basis of CMMI®. The so-called Value Network Maturity Model (see also Fig. 9, Phase 1) assesses and optimizes collaboration between OEMs, suppliers, dealers and importers. It defines maturity levels on the basis of criteria such as the intensity of collaboration or cross-company process integration.

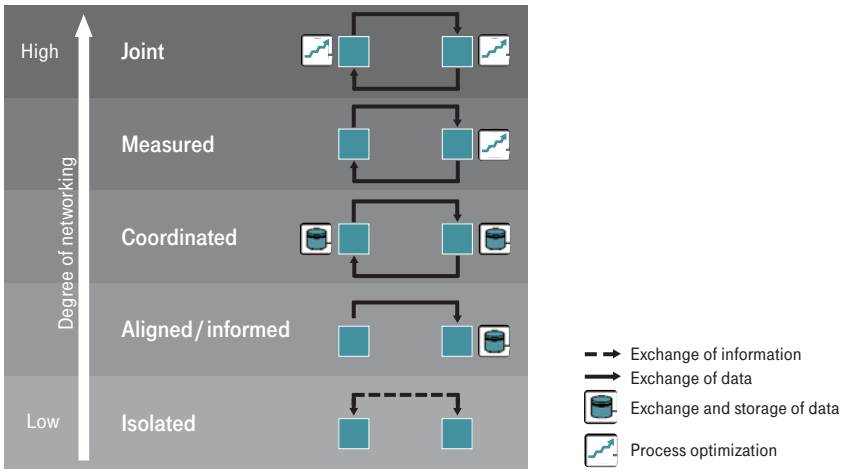

Figure 9: T-Systems, 2007: Network maturity model.

The various stages of the model identify five degrees of networking:

1. Isolated degree of networking.
Businesses on this level operate independently of each other. Data is not exchanged and networking does not entail additional values. Independent businesses are a rarity in the automotive industry.

2. Aligned/informed degree of networking.
The participating businesses confer on the results of their work during the development and production phases. Data is mostly exchanged at a different time, e.g. by means of data exchange portals. The increase in value for networking is small.

3. Coordinated degree of networking.
Data exchange processes between the cooperating businesses is clearly defined in logistics as well as in engineering. A process is established for responding to changes in requirements (continuous process improvement). The increase in value for networking is considerable.

4. Measured degree of networking.
At this level processes are not only coordinated, but their quality is also measured and evaluated. The participating businesses carry out shared process controlling. The increase in value for networking is crucial to the company's survival.

5. Joint degree of networking.
Cross-company processes are not only evaluated in the joint degree of networking, but also optimized. Corresponding interface definitions enable complete, cross-company communication. If requirements change, the cooperating businesses adjust to the new situation with agility. At this level the increase in value for networking is the object of business activity in the network.

3.2 The role of T-Systems in value networks.

T-Systems regards itself as an independent “network manager”. On the one hand, the business provides manufacturers and suppliers with the technical infrastructure required on both sides for the definition of interfaces, standardization and implementation. On the other hand, services are also available in the area of process management and process optimization, as well as consultation. These enable a value network to be set up on a step-by-step basis without complications.

In value networks, cross-company collaboration takes place in the engineering, production, sales and services phases. T-Systems is available to the participants on both a cross-process and cross-company basis, acting as an adviser, enabler and partner. Because even the “cultural change” should not be underestimated, an accompanying ‘Change Program’ is provided. This covers information and communication topics, as well as coaching and training courses. The automotive industry is expecting a paradigm shift in the near future. Heterogeneous OEM-supplier relationships with varying levels of information and coordination and an unwillingness to cooperate are becoming increasingly rare. They are being replaced with independently operated value networks in which OEMs and suppliers participate in a similar way. Platforms with integrated services take account of the requirements for networks offering added value.

3.3 Solutions and concepts for value networks.

3.3.1 Business Connect Services – the Business Integration Platform.

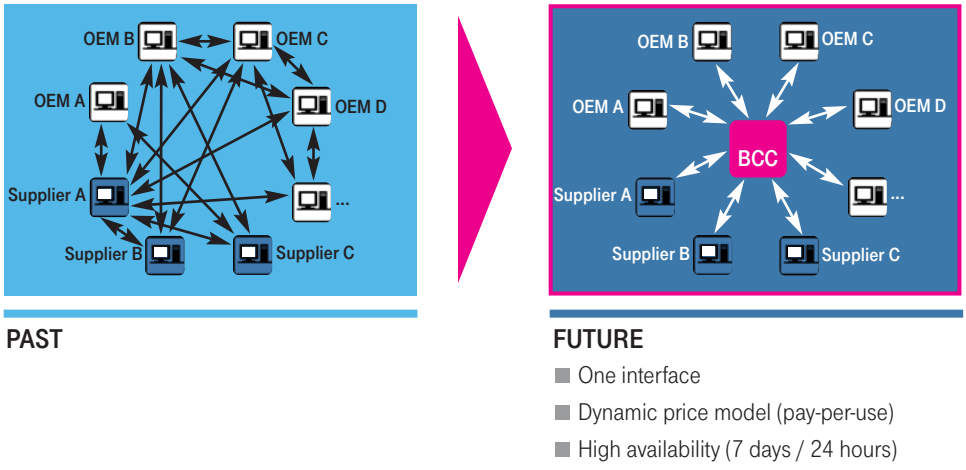

Figure 10: T-Systems: Business Connect Center – greater efficiency thanks to an integrated, networked platform.

T-Systems uses the Business Connect Center (BCC) to offer customers from the automotive industry an homogeneous platform that unites both suppliers and OEMs and supplies all participants with the information they require. Only one interface is required and the problem of different data formats no longer applies. Thanks to Service Level Agreements, the platform offers continuous availability. Flexible price models are based on different usage patterns. In the Value Network Maturity Model, BCC can be placed under ‘Coordinated degree of networking’.

In addition to professional associations and numerous businesses from the retail and industry sectors, some companies from the automotive segment, among them Daimler and Agco Fendt GmbH, already use the Business Connect Center from T-Systems. At present there are over 4,000 communication partners, around 600 applications and 22 different SAP systems connected to the BCC.

3.3.2 Engineering collaboration services.

In the engineering sector, T-Systems offers several standardized services for cross-company collaboration. The various services complement one another and in some cases are interwoven. The offer encompasses:

- Services for process synchronization
  - Collaborative change management
  - Collaborative project management
- Additional services for protecting sensitive product information
  - Collaborative digital rights management
- Services for exchanging product data
  - Engineering data collaboration
- Services for infrastructure management for development workplaces in cooperative projects
  - Engineering workplaces
- Integrated communication solutions, such as voice and video conferencing, application sharing, etc.
  - Community collaboration services

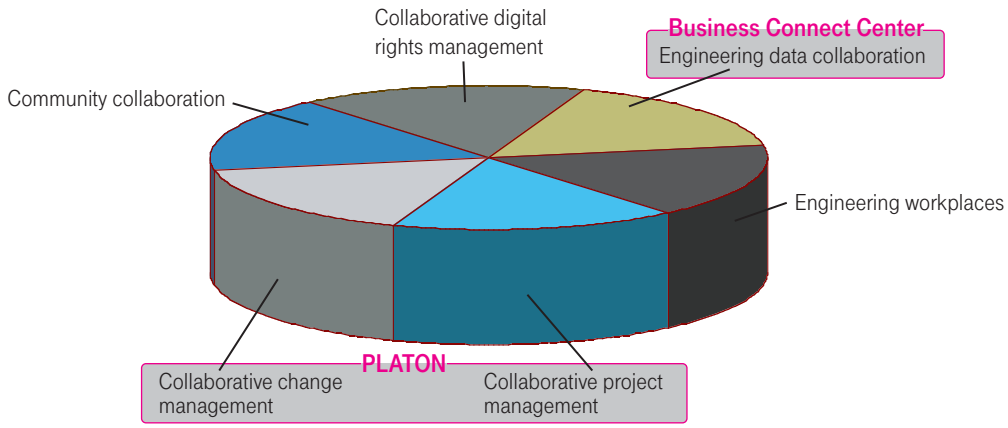

Figure 11: T-Systems, 2007: Engineering collaboration services.

The PLATON concept shows how services for collaborative change and project management can be combined.

PLATON stands for “Platform for Orchestrated Engineering Networks”. Following the pioneering trend in the direction of value networks and cross-company project houses, this concept establishes a new engineering logistics service between companies. While in the past it was possible for OEMs largely to prescribe processes to suppliers, cooperation is now to the fore: OEMs work together with suppliers or with other OEMs on the basis of shared processes. All partners are equal. PLATON provides the basis for this new culture of collaboration. T-Systems not only provides comprehensive advice on how to achieve this goal, but also provides support with reducing process costs, increasing product quality and optimizing project management.

On a technical level, T-Systems offers an integrated, branch-specific process solution based on web services and network-centric computing, among other things. A T-Systems SOA framework and Internet-based telecommunications platform can be used in parallel with this. The availability of services increases for the members of the network due to worldwide usage on a 24-hour basis. Secure connections can be established between the various parties on a worldwide basis. New partners can also be integrated quickly and securely in PLATON.

A transparent information logistics system integrated in a mailing system increases process security and reduces the need for revision. This requires compliance with shared rules for the distribution of information. A uniform level of information must be guaranteed within Development. Ensuring that changes are implemented quickly. However, the data is not stored in the PDM system, so that data ownership remains with the partners.

3.3.3 Just-In-Time and Just-In-Sequence solutions.

In order to be integrated in the logistics procedures used by car manufacturers, suppliers have always had to locate their businesses near to manufacturers, so as to ensure the best possible delivery in line with precise sequences. However, because OEMs do not only use local supplier companies, supply chains now also need to work on an international level. Just-In-Time and Just-In-Sequence solutions (JIT and JIS) support suppliers in handling these logistics processes. They ensure the that OEMs are supplied with the right volumes at the right time and reduce the complexity for all those involved. JIT/JIS solutions can be positioned on the 'Aligned/Informed degree of networking' level in the Value Network Maturity Model.

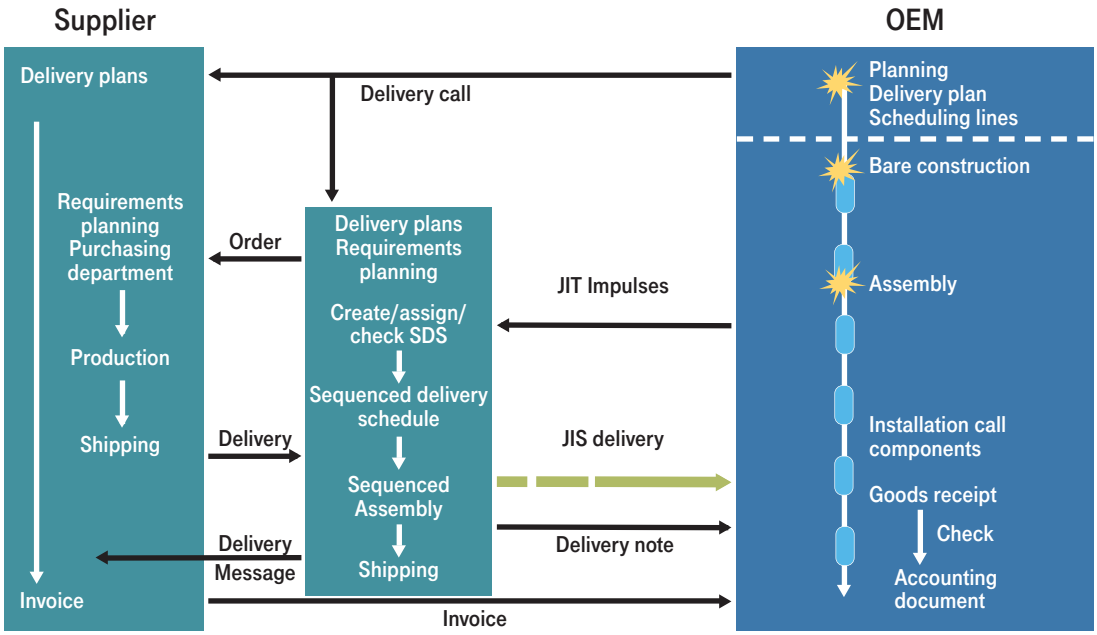

Figure 12: T-Systems: Just-In-Time/Just-In-Sequence with SAP R/3.

As can be seen in the diagram, short-term logistical processes (process JIT/JIS impulses, final assembly, sequential delivery) are mapped by the separate solution at local level. The central functions are still controller by the supplier through his home factory, including requirement planning, production of semi-finished products, purchasing or the handling of financial transactions with the manufacturer. The open architecture of JIT/JIS solutions permits a simple link to the OEM's central SAP system or to another system. JIT/JIS systems are economical and relatively fast to implement. In most cases, such systems are ready for use after just a few weeks.

The greatest benefit from JIT/JIS systems, however, lies in the cost savings that can be achieved through such optimized logistics processes. JIT/JIS solutions have already been used very successfully at Leoni (cable harnesses) and Novem (high quality wooden components). Solutions have also been implemented at BMW to support the delivery of the company's own assembly plant.

3.3.4 Supplier management – Supplier Management Base (SMB).

In extreme cases, shortages of materials can bring series production to a standstill. In order to avoid this, enormous effort is often expended in looking for alternative suppliers. Stocks are moved between the various production facilities and special trips are organized. The aim of value networks is to avoid these costly special measures or at least to reduce them without threatening smooth, uninterrupted supply to the production centers. Supplier Management Base (SMB) from T-Systems is a very promising solution and is used by Daimler. SMB is an e-Business solution based in the latest web technologies which is used by Daimler and its suppliers as an interactive information and exchange platform. It continuously evaluates and optimizes the logistics processes within the supply chain. SMB is positioned on the 'Measured degree of networking' level in the Value Network Maturity Model.

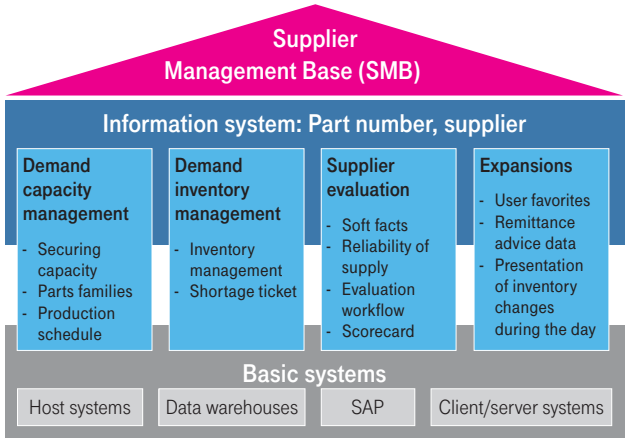

Figure 13: T-Systems: Supplier Management Base – communication with suppliers.

The central functional areas of SMB are demand capacity management, demand inventory management and supplier evaluation.
Demand capacity management registers the capacities of the suppliers and compares this information with the demands for the next nine months at parts number level. Possible capacity bottlenecks are identified in advance and countermeasures can be taken at an early stage. Demand capacity management is mainly used for capacity-critical deliveries. Demand inventory management is a standardized process that controls deliveries to Daimler. Demand inventory management ensures transparency in terms of requirements and inventory for all participating partners and enables the supply process to be optimized on a cross-company basis. Automatic detection of bottlenecks and standardized bottleneck management increase the speed of reactions in the event of process faults. Supplier evaluation involves the standardized measurement and evaluation of supplier performance on the basis of defined criteria. An external balanced scorecard incorporates the results into the purchasing process. Possible improvements are drawn up together with the supplier in order to increase delivery performance on a lasting basis and to develop suppliers in an effective way.

SMB eliminates many information imbalances between the partners and thus reduces the effort involved in coordinating businesses. It shortens response times in the event of problems and facilitates lean stock management. The supplier plays an active role in SMB. He can intervene in the process by means of the automatic warning system and can prevent delivery backlogs. The early warning system stabilizes processes and offers suppliers feedback about the quality of their products. The web-based structure of SMB enables new suppliers to be integrated quickly.

3.3.5 Request and change management – Request for quotation.

Inadequate request management often leads to extremely high costs for suppliers. Thus, according to a survey by gedas USA from 2005, around 24% of offers are submitted too late, 40% contain errors, 80% of all development changes are not included in the calculations, 30% of development time and 50% of sales time is wasted on lost offers and 50% of requests are never answered at all. In addition, requests are sent to supplier locations that are not responsible for producing offers.

Here OEMs and suppliers require an integrated solution for request management that covers the entire process from the dispatch of the request by the OEM to the provision of the offer by the supplier. Processes must be organized robustly and in a standardized way irrespective of specific OEMs. In addition, the offer process should be speeded up in order to make the cost of drawing up offers transparent for the supplier.

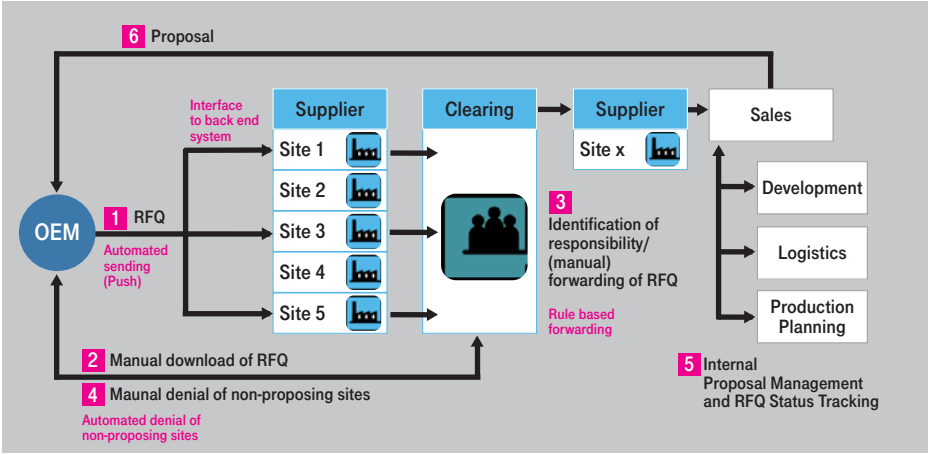

Figure 14: T-Systems, 2007: Solutions and concepts for value networks. RFQ management process.

Request for Quotation Management from T-Systems (RFQ Management) defines and controls this process. It resolves interface problems within value networks and increases the efficiency of the offer process. Because all participants are included in the RFQ process, from the OEM and part supplier to the material supplier, inventory, capacity, time and know-how requirements can also be determined much faster.

This is one of many options for integrating other areas and processes and for using the advantages of a networked added value, so as also to improve these secondary processes on a permanent basis.

3.4 Conclusion.

Networked added value represents both a challenge and an opportunity. It stands for a significant change in the sector, which is proceeding at a gradual, yet unstoppable pace.

This white paper outlines solutions and concepts. You will find further information in “Weltweit vernetzt – Konzepte und Handlungsfelder für die Automobilindustrie” (Worldwide Networking – Concepts and Points of Activity for the Automotive Industry) published by Log_X-Verlag, ISBN: 978-3-932298-31-8.

4. Glossary of Terms.

BCC:	Business Connect Center
CAD:	Computer Aided Design
CAM:	Computer Aided Manufacturing
CAx:	Computer Aided x
CMMI®:	Capability Maturity Model Integration® CMMI® is a registered trademark of the Software Engineering Institute of Carnegie-Mellon University in Pittsburgh, USA.
CRM:	Customer Relationship Management
EBIT margin:	Ratio of EBIT to sales
ERP:	Enterprise Resource Planning.
FEM:	Finite Element Method
ICT:	Information and Communication Technology
JIT:	Just-In-Time
JIS:	Just-In-Sequence
OEM:	Original Equipment Manufacturer
PDM:	Product Data Management
PLATON:	Platform for Orchestrated Engineering Networks
PLM:	Product Lifecycle Management
RFID:	Radio Frequency Identification
RFQ:	Request for Quotation
ROCE:	Return on Capital Employed
SCM:	Supply Chain Management
SDS:	Sequenced Delivery Schedule
SMB:	Supplier Management Base
SOA:	Service-Oriented Architecture
SOA Framework:	Uniform basis for applications based on SOA architecture.

5. List of Figures.

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