
Automotive System Integrators:

Spiders or flies in the e-Business web?

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A. Executive Summary: How System Integrators can weave the e-Business web

A year ago, when enthusiasm for e-Business was sweeping the automotive industry in the U.S., we took a then unconventional position that e-Business benefits would be significant but lower than expected, and both slower and more difficult to achieve than the prevailing wisdom suggested.

Today, in an atmosphere of pessimism about what e-Business tools can do and at a moment when companies are dramatically reducing IT investments, Roland Berger – Strategy Consultants and the Office for Study of Automotive Transportation (OSAT) challenge the widespread doubts, suggesting that e-Business is not just another fad, but that it provides large opportunities for those companies that are ready to proactively (and strategically) pursue them.

In this study, we focus on System Integrators (SI), because of their importance as the nodes linking OEMs to the wider supply base.

The key question that we address is whether System Integrators will weave the e-Business web or be trapped in it.

**Will System Integrators
weave the e-Business web
or be trapped in it?**

We selected two critical threads, **Product Development** (up and down the supply chain) and **Relationship Management** (toward OEM customers), to discuss and highlight both the potential benefits and the risks of e-Business tools and solutions for System Integrators. These threads are critical because:

- > Both the quantity and the value of the interactions are high.
- > The uncertainties of the key industry tensions are particularly evident, especially in how they will influence the lower tiers.
- > The direction taken by the System Integrators will clearly influence their competitive advantage, as well as the shifts in the power balance.

Four tensions define the e-Business web

We identify four key “tensions” in the industry. How the industry resolves them will determine the speed and direction of change. How System Integrators deal with them will define their strategic direction and whether or not they are ultimately successful.

Four tensions determine the speed and direction of change

Tension	Dilemma	Drivers
1 Transparency	Sharing or shielding information	<ul style="list-style-type: none"> • SI/OEM relationship • Level of confidence • The “commodity threat”
2 Standards	Building or dismantling the proprietary network	<ul style="list-style-type: none"> • Technology constraints • Third parties (e.g. covisint) • Competitive advantage
3 Business case	Increasing value or decreasing costs	<ul style="list-style-type: none"> • Customer demand • Impact on innovation • Hard cost reductions • “Soft” benefits
4 Power	Weaving the web or being trapped in it	<ul style="list-style-type: none"> • Balance of responsibility and control

Source: OSAT; Roland Berger – Strategy Consultants

1. The transparency dilemma: data sharing is central to how much value e-Business initiatives can create. However, protecting proprietary knowledge is what provides SIs negotiating power with their OEM customers. No matter how strong the relationship with their customers is, System Integrators will always shield part of their data to protect the “engineered content” aspect of their products.

- > Because of this, what technology allows – **perfect transparency between OEMs and SIs – is an unrealistic goal.**
- > **SIs will shield their information as a protection against “market-based” relationships**, which keep them at arms-length from their customers and are only as strong as the System Integrators’ next bid.
- > On top of this, **the security that can be offered by the systems and technology is not perceived as sufficient yet.** To prevent sensitive data from leaking to the competition, SIs will continue to hold them behind their own firewalls.
- > If data are transparent, there is a greater risk that the knowledge behind the products will become a commodity. **How can OEMs ensure that System Integrators’ intellectual property will be maintained?** This threat encourages SIs to keep as much data shielded as possible.

2. The standardization dilemma: The approach to standardization is contradictory: The industry does not want to recreate the inefficiencies it experienced with the adoption of multiple CAD Systems. However, no one is ready to give up the security of their proprietary systems. Therefore, we don't believe that system standardization will be the industry's silver bullet:

- > **Proprietary systems will continue to be the preferred option** for information and transactions that are perceived as competitively sensitive.
- > The industry is still skeptical about the capabilities – even of the latest suites – to combine integration ability and security. **Technology alone does not provide a compelling reason to shift from proprietary systems.**
- > The emergence of **a powerful third party might dramatically accelerate the creation of an industry standard.** The initiatives that Covisint is rolling out may play a major role in defining the timing and extent of standardization.
- > Although **Covisint** has the widest window of opportunity to set the standard, **it might not be the only player.** Theoretically, one of the large software providers may end up defining a standard that the industry supports.

3. The business case dilemma: All System Integrators have ROI or NPV targets to reach for new capital investments, and e-Business initiatives are costly to implement. There are two dominant ways of making the business case to justify new e-Business investments, both of which are strongly influenced by the current economic environment and are somewhat simplistic in that they fail to recognize the entire potential of the initiatives.

- > Reducing costs: Fact-based justification of e-Business investments – the opposite of what was happening a year ago – is required. But many cost reduction potentials are “soft” as are most value adding opportunities. **Unless the “soft” and indirect benefits are recognized, the impact of e-Business will be severely undervalued.**
- > Customer mandate: e-PD proves that initiatives led by OEMs are promptly adopted by SIs. This **reactive approach can cause unnecessary costs** – as in e-PD where the threat of multiple proprietary software systems is real – **or prevent SIs from creating differentiating value** – as with e-RM if SIs wait for OEMs to mandate it.

4. The question of power: Whether System Integrators lead the development of e-Business initiatives will determine whether they become the “spider” or the “fly.” Utilizing e-Business technology can enable System Integrators to take control of their supply chain. However, the same technology provides OEMs the opportunity to continue and even accelerate delegating responsibility while using transparency to maintain full control.

- > While most System Integrators believe that controlling design activities will increase their power, we believe **that the pervasive transparency of information might actually allow OEMs to regain some of the control they have surrendered in the past.**
- > Regardless of the outcome, it is important for System Integrators to consider the “risks” of e-Business today. **It is in the SIs own interest – and ultimately in that of the entire industry – to take a proactive role in developing the e-Business web.**

Controlling the thread of power: e-Enabling Product Development is the area where the industry is currently placing its strongest emphasis, confirming the findings of our previous report. The efforts are clearly driven by OEM initiatives and are “forcing” SIs to keep pace.¹ Not surprisingly, the tensions that we identify are particularly evident:

- > **Intellectual property rights: Sixty percent of the interviewees mention the concern about the security and confidentiality of their proprietary data.** Because of the importance of protecting proprietary knowledge, full transparency is an unrealistic goal.
- > The interviewees feel that **in the future much e-PD will still be done on proprietary networks.** As one OEM interviewee put it, “there is still a debate about whether having your own CAD system is a competitive advantage or not.”
- > **System standardization could happen in the lower tiers first.** At that level few suppliers are tied to any e-PD system. A third party such as Covisint could conceivably create a cost-effective standard that would be accepted by all the lower tier suppliers.
- > In an environment where economic resources are scarce, **it is unthinkable for System Integrators to repeat the CAD experience. The emergence of a powerful third party might create an industry standard.** The initiatives that Covisint is rolling out will play a major role in defining the timing and the extent of standardization.
- > The OEMs are driving e-PD. Still, SIs are able to build viable business cases to justify additional investments. **Time savings:** The interviewees estimate time savings from 20 to 50 percent of overall product development time by 2004. This will enable suppliers to reduce product development from the current 24 to 36 months to 12 to 29 months.

¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

- > **Cost savings:** Cost savings are the most prominent element of e-PD. The interviewees estimate that implementing e-PD could reduce product development costs by 10 to 25 percent. The cost savings will come from the overall reduction in development time, the reduction in the number of engineer hours required for a specific development project, the increased reuse of existing designs and a reduction in the number of prototypes required.
- > The prevailing belief is that **e-Business processes and technology will allow companies to improve their ability to innovate.** Decreasing product development time (allowing more time to be creative) coupled with an increase in communication and access to data should foster an expansion in innovation.
- > We argue that **SIs do not adequately assess the possible ramifications of web-based technology on the distribution of power within the industry.** Fifty percent of those interviewed feel that e-PD will shift power to the System Integrator. The other 46 percent believe that it will not have an impact one way or the other. No one interviewed sees e-PD as helping the OEMs gain power.

Building the invisible thread: e-Enabling Relationship Management is perhaps the ultimate integrating platform for e-Business efforts. However, because of the difficulty it entails, most SIs have not focused enough on this opportunity:

- > **The justification for not implementing e-Relationship Management (e-RM) is the lack of a strong business case.** Many of the benefits that can be obtained with e-RM tools fall into the “soft” category, and are therefore hard to quantify.
- > **We suggest that the real reason SIs are not focusing on e-RM is that the OEMs are not pushing for it ...**
- > **... and that effectively e-Enabling Relationship Management requires SIs to put their process house in order first** – a major hurdle for most System Integrators, especially since most of them have grown through mergers.
- > We argue that ignoring the value opportunities of e-RM and taking **a reactive approach to the customer’s demand will prevent SIs from capturing opportunities** to differentiate themselves with their OEM customers, keeping them from becoming more valuable suppliers and ultimately a more powerful “spider.”
- > Although the communication flow between SI and OEMs – the backbone of e-RM – will be customized to meet the needs of each specific customer – **standardization is still an issue that creates an opportunity for a third party player.** A service provider such as Covisint could attract a critical mass with its product offering and create a de facto standard.

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- > Although soft benefits might be prevalent with e-RM, **hard benefits created by improved two-way communication with the customer will be significant as well.** In **warranty tracking**, for example, **streamlining the communication system will eliminate the lag time in warranty data flowing** to the SIs, allowing them to make production changes more quickly. Our earlier report suggests that a 10 percent reduction in warranty costs through such e-Applications is possible.
 - > **Improved forecasting:** Several respondents mention that if there were increased transparency in the flow of information, OEMs, System Integrators and the lower tiers would be able to create more accurate and realistic forecasts. Our earlier work suggests important hard cost savings from improved forecasting and communication: a 2 percent productivity improvement, a 10 percent reduction in scrap and rework, a 20 percent reduction in inventory, and a 10 percent reduction in transportation costs.¹

In the final part of the report, we suggest a roadmap and an approach to successfully master the e-Business challenge. Failing to do so will mean being caught off-guard by the competition and ultimately being trapped in the e-Business web.

Our approach and the case study that we describe are based on a carefully planned but pragmatic sequence of steps:

- > **Create your company's reality-based e-Business strategy:** Be realistic when defining the goals and assessing your starting point; but challenge and overcome your company's internal silo mentality.
- > **Understand your tactical options:** Spend enough time to decide what initiatives fit your company. Assess costs and benefits and – once again – be pragmatic in deciding what can or cannot be achieved internally.
- > **Plan:** Carefully anticipate the impact and the changes required for your organization – and how to get people involved.
- > **Implement, refine and revise:** Use pilots to test the strategy and create a success story before rolling out the entire plan. Be ready to reevaluate your assumptions and make the necessary changes.

SIs need to take a proactive approach in developing their e-Business systems. It is in the interest of the industry as well as of the SIs for them to lead the charge, influencing the speed and direction of e-Business change.

¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

B. A different perspective: The System Integrators' web

e-Business is changing the way companies interact with one another. The increased availability of data and opportunities for collaboration are spinning a web of interactions that affect OEMs, System Integrators and lower tier suppliers alike. The uncertainties surrounding the development of this web leave open the question of who will be the spider, determining the flow of e-Business initiatives, and who will be the fly, forced to follow the path set by others. This study looks at the progress of some of these initiatives to help answer the question of who ultimately will be the spider.

Has the revolution failed?

One year ago, Roland Berger and Deutsche Bank conducted an extensive study¹ that counterbalanced the industry's digital euphoria, finding that there was no revolution in sight for the automotive industry, but rather a slower-paced, longer term evolution.

Today, Roland Berger and the Office for Automotive Transportation once again challenge the industry's prevailing mood – fueled by the economic slowdown – which seems to view e-Business as just another fad that will soon transition to the next focus.

A different perspective: e-Business from the standpoint of the System Integrator

Much has been said about the role that e-Business might or might not play in changing the automotive industry. In our opinion, e-Business is a powerful tool that will contribute to the radical redefinition of the processes and maybe even alter the roles of the industry players. OEMs and the final customer are generally considered to be driving forces in the industry, and most analyses look at the impact of e-Business from their point of view.

However, OSAT has documented the expanding role of System Integrators (SIs)² and their growing portion of the industry's value creation. Nevertheless, little research has been done on how they are affected by e-Business. In many cases, participating in the e-Transformation is not a choice. OEMs are forcing the SIs to move forward. On the other hand, System Integrators have to pull along lower tier suppliers who also need to participate if full industrywide benefits are to be realized.

Who will be the spider and who will be the fly?

Roland Berger and the Office for Automotive Transportation once again challenge the industry's prevailing mood.

¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

² **OEM Parts Purchasing: Shifting Strategies**, OSAT, January 2001, and **The 21st Century Supply Chain**, OSAT, 1996.

For the purpose of this study, we define a System Integrator as a Tier One supplier that has the capability to do the full engineering, assembly and integration of automotive systems that stretch across multiple modules and sub suppliers. There is obviously some ambiguity surrounding the term, as there is for the concepts of systems, modules and components. Most suppliers are and will stay mixed, acting as SIs, Tier Ones and even Tier Twos, but it is their primary business that will fix their future strategies.

From the System Integrators' standpoint several questions are still unanswered:

- > How fast will change occur?
- > What factors will accelerate or slow the pace?
- > Will System Integrators be proactive in defining the rules of the game, or must they always follow the OEM?

And, most importantly:

- > Will System Integrators win or lose?

Four tensions determine the speed and direction of change

Tension	Dilemma	Drivers
1 Transparency	Sharing or shielding information	<ul style="list-style-type: none"> • SI/OEM relationship • Level of confidence • The "commodity threat"
2 Standards	Building or dismantling the proprietary network	<ul style="list-style-type: none"> • Technology constraints • Third parties (e.g. covisint) • Competitive advantage
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Source: OSAT; Roland Berger - Strategy Consultants

Key tensions affecting the industry

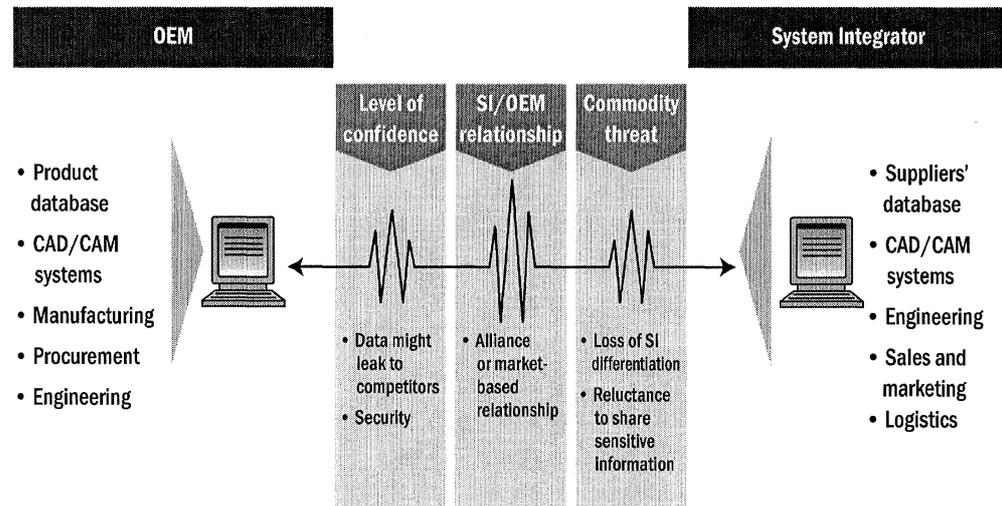
Our study has identified four key “tensions” in the industry. How the industry resolves them will determine the speed and direction of change. How System Integrators deal with the tensions will define their strategic direction and whether or not they are ultimately successful.

1. Sharing or shielding: the transparency dilemma

Transparency is a key ingredient in all e-Business initiatives. One of the most common concerns mentioned by System Integrators is how to find the right balance between sharing information and protecting proprietary knowledge. The value gained from e-Business relationships is directly related to how much data is available, but no company is ready to have all of its most important data shared with the world.

System Integrators must find the right balance between sharing information and protecting proprietary knowledge.

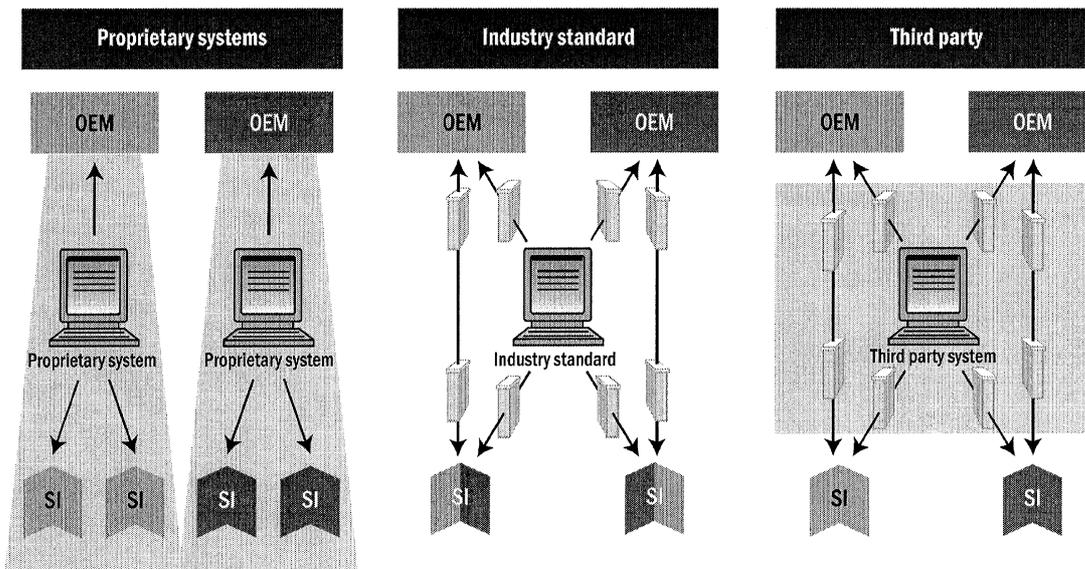
The transparency dilemma: What is the right balance between information sharing or shielding?



Source: OSAT; Roland Berger – Strategy Consultants

One hundred percent sharing is unrealistic for System Integrators. In spite of its technical feasibility, complete openness is not necessarily desirable. System Integrators will choose the level of transparency that is right for them, based upon a negotiated relationship with their OEM customers.

The standardization dilemma: Will the industry overcome its proprietary systems?



Source: OSAT; Roland Berger - Strategy Consultants

2. Building or dismantling the proprietary network: the standardization dilemma

The most mentioned requirement for e-Business in the automotive industry is some level of standardization. The CAD implementations of the 1980s, when each OEM went after its own proprietary system, and the pain this caused suppliers are invariably cited as supporting evidence that standardization is necessary.

In reality, the industry is conflicted about standardization. OEMs and System Integrators all want standards, but at the same time want proprietary networks to protect their data and sensitive information. Because of this, proprietary networks will not disappear overnight. Hurdles must be removed, but above all, the level of standardization that the industry actually considers desirable must be determined.

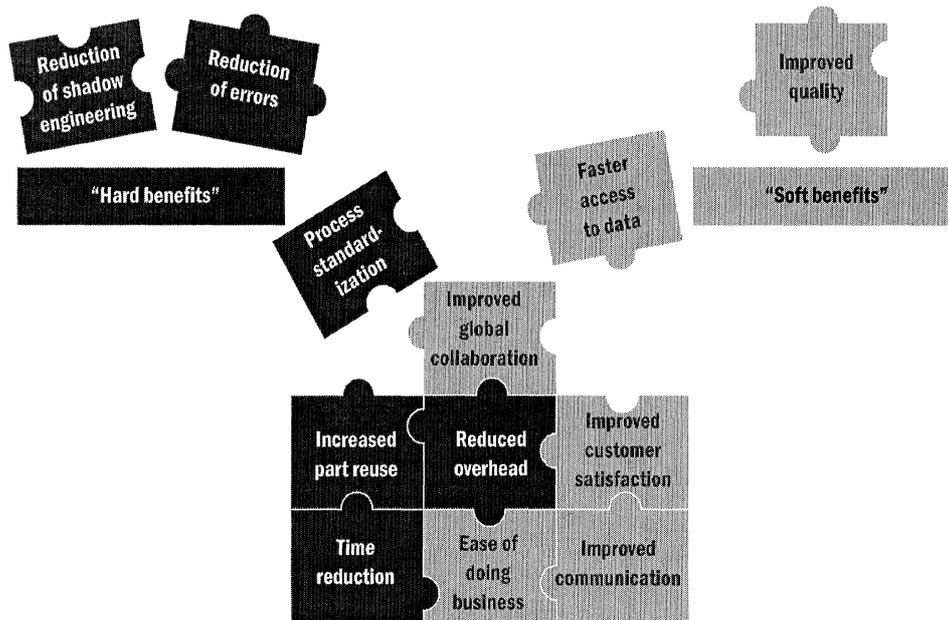
The automotive industry requires some level of standardization.

3. Increasing value or decreasing costs: The business case dilemma

The customer is the primary driver of System Integrators' e-Business investments. If the OEM requires an initiative, SIs will likely implement it. However, SIs that make investments above and beyond customer requirements must decide whether to develop the business case based on hard cost savings or on the potential to increase value.

The customer is the primary driver of System Integrators' e-Business investments.

The business case dilemma: How to justify e-Business investments?



Source: OSAT; Roland Berger - Strategy Consultants

We believe that most companies are making tactical investments based solely on the cost-reduction potential. However, a few visionary players make e-Business decisions with a more strategic perspective, based on the opportunity to increase value.

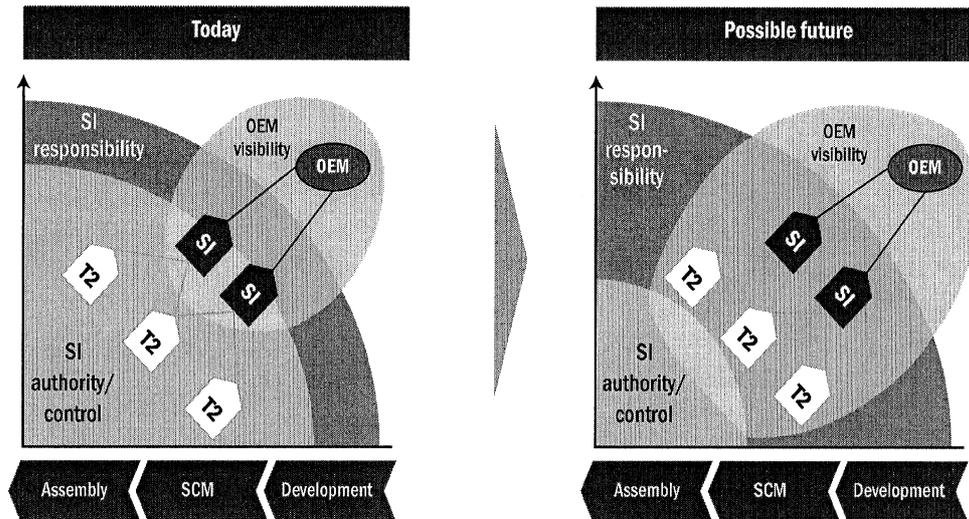
4. Weaving the e-Business web or being trapped in it: the question of power

What happens to the balance of power in the industry is the key uncertainty facing both OEMs and System Integrators. Over the past decade, power has been shifting to System Integrators. Now they must ask themselves if e-Business will accelerate or reverse the trend.

Whoever leads the development of e-Business in the industry will largely determine who gains or loses power. In some areas, such as Product Development, it seems clear that the OEMs will lead the initiative. This means they will have a greater influence over what power they surrender and what power they retain. In other areas, the picture is less clear: if technology gives OEMs greater transparency into the entire supply chain, they have a greater opportunity to influence it. On the other hand, System Integrators can decide to take the lead and control the visibility, influencing the shift in power in their own favor.

Whoever leads the development of e-Business in the industry will determine who gains or loses power.

e-Business transparency may help OEMs regain control of the supply chain



Source: OSAT; Roland Berger – Strategy Consultants

We believe that the role of e-Business as it relates to power has not yet been adequately analyzed. e-Business offers a greater opportunity for OEMs to delegate responsibility while still maintaining control. However, we are not persuaded that this will definitely happen or that it will necessarily create antagonistic SI/OEM relationships. Several factors could negate such a scenario. First, OEMs might maintain their belief that alliance type relationships are more beneficial. Second, OEMs might shed their engineering capabilities as they transfer those responsibilities to the SIs.

Regardless of the outcome, it is important for System Integrators to consider the “risks” of e-Business today. It is in their own interest, and ultimately in that of the entire industry, to take a proactive role in developing these e-Threads.

Proactively spinning the web will prevent SIs from being trapped in it.

Proactively spinning the web will prevent SIs from being trapped in it.

The focus of this study

There is broad consensus in the industry: there is no e-Business silver bullet. No single tool or function will allow companies to reap all or even most of the potential benefits. Savings and benefits will have to come from numerous functions and processes.

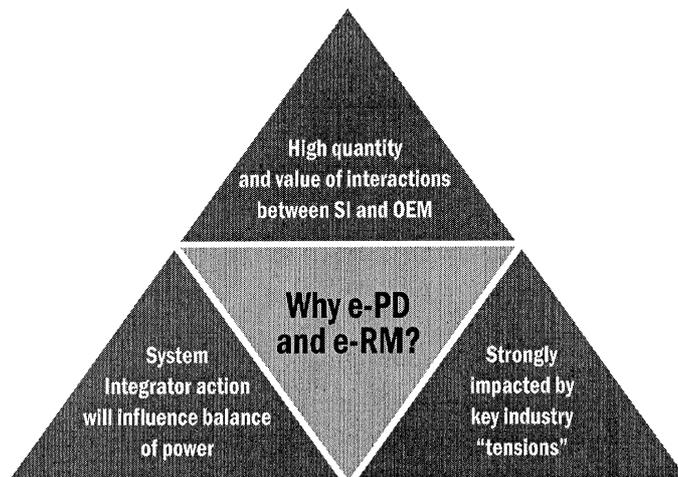
For this study, we focus on the role that web-enabled initiatives will play in determining whether System Integrators become “spiders” or “flies” in the automotive e-Business web. We deliberately selected two specific threads of the e-Business web that highlight both the potential benefits and the risks for System Integrators: **Product Development** (up and down the supply chain) and **Relationship Management** (toward OEM customers).

We selected two specific threads of the e-Business web: Product Development and Relationship Management.

There are three reasons why we feel these are the defining threads of the e-Business web. They are the threads where:

- > Both the quantity and the value of interactions in the relationship throughout the supply chain are very high.
- > Key industry tensions are particularly evident.
- > The direction taken by the System Integrators will clearly influence their competitive advantage as well as the shifts in the power balance.

e-Product Development and e-Relationship Management are key to understanding the benefits and risks for SIs



Source: OSAT; Roland Berger – Strategy Consultants

Although not a focus of this study, we recognize the importance of other e-Business web-threads for System Integrators, such as e-Procurement and e-Supply Chain Management. They are central to the overall e-Business initiatives of the SIs and warrant further research.

e-PD and e-RM: A competitive advantage

e-Product Development and e-Relationship Management offer a significant opportunity for System Integrators to weave a competitive advantage, either through major time and cost savings or through the ability to differentiate themselves from the competition. The opportunity exists for them to design the interactive web, placing themselves in control at the center. However, they must make the right strategic moves to get there ahead of both the competition and their OEM customers.

Product Development is the area where System Integrators can most dramatically gain or lose power relative to the OEMs. The OEMs continue to outsource more of their development and engineering work to the System Integrators, giving the SIs the responsibility for, but not necessarily the control of the underlying processes. How the System Integrators will make use of “e-” technologies to collaborate, both internally and externally, will define their competitive advantage.

We see e-Relationship Management as the “invisible” thread in the e-Business web. It is a thread that has tremendous potential for changing the industry. However, System Integrators have not yet focused on it.

For the purpose of this study, we define e-RM as a set of web-enabled activities that allow SIs to consolidate information from all customer-related and supply chain activities. These systems will be used to improve the interaction with their OEM customers. In essence, e-RM is the platform that links the other e-Business systems together into a single customer focus.

Relationship Management has always been critical for supplier success. How System Integrators will use “e-” technologies to improve RM remains to be seen.

We feel the potential in this area could be huge. In most cases communication flows are less than optimal: suppliers communicate with their OEM counterparts on multiple levels, and complexity is increased by the same activities happening simultaneously in various business units of the OEM and the SI. The key questions are to what extent technology will allow coordination of these activities, what benefits can be expected, and what steps should be taken.

The methodology

The analysis in this study is based on approximately 50 interviews conducted in June and July with executives at major System Integrators, OEMs and lower tier suppliers. The companies and interview partners were deliberately chosen to cover most major functions (engineering, purchasing, sales/marketing, IT/e-Business, and general management) and to describe fully the perspective of the System

e-PD and e-RM offer significant opportunities for System Integrators.

Product Development is where SIs can most dramatically gain or lose power relative to the OEMs.

We see e-RM as the “invisible” thread in the e-Business web.

e-RM is the platform that links other e-Business systems together in a single customer focus.

Integrator within its boundaries (the OEMs and the lower tiers). Discussions with our advisory board provided important contributions. We gathered additional information from publicly available sources.

The cases presented here are based on the experiences of real companies interviewed for this study. Neither OSAT nor Roland Berger were involved in their efforts.

The future of e-Business in the automotive industry will be shaped by three interacting drivers.

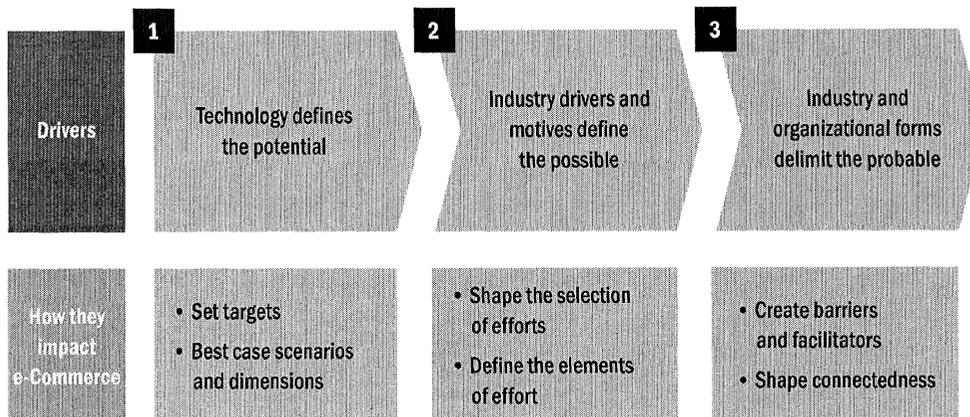
Potential, Possible, Probable

1. *The technology will determine the potential. The first key limitation of e-Business is what the software can and cannot do. As software and hardware capabilities grow, the potential for e-Business expands.*

2. *The industry will determine what is possible. Given the nature of the automotive industry, the full potential offered by e-Business technology might not be realistically achieved. Some technically feasible e-Business initiatives just do not make business sense in the automotive context, and others may not overcome the barriers to implementation.*

3. *How the industry and the companies are organized will determine what is actually probable. Organizational structures, and/or resistance to change, may make the implementation of sound e-Business initiatives impossible. Determining what changes most easily fit the industry identifies what initiatives will most likely or readily be adopted.*

Three drivers will determine successful implementation of e-Business in the automotive industry



C. Controlling the thread of power: e-Enabling Product Development (e-PD)

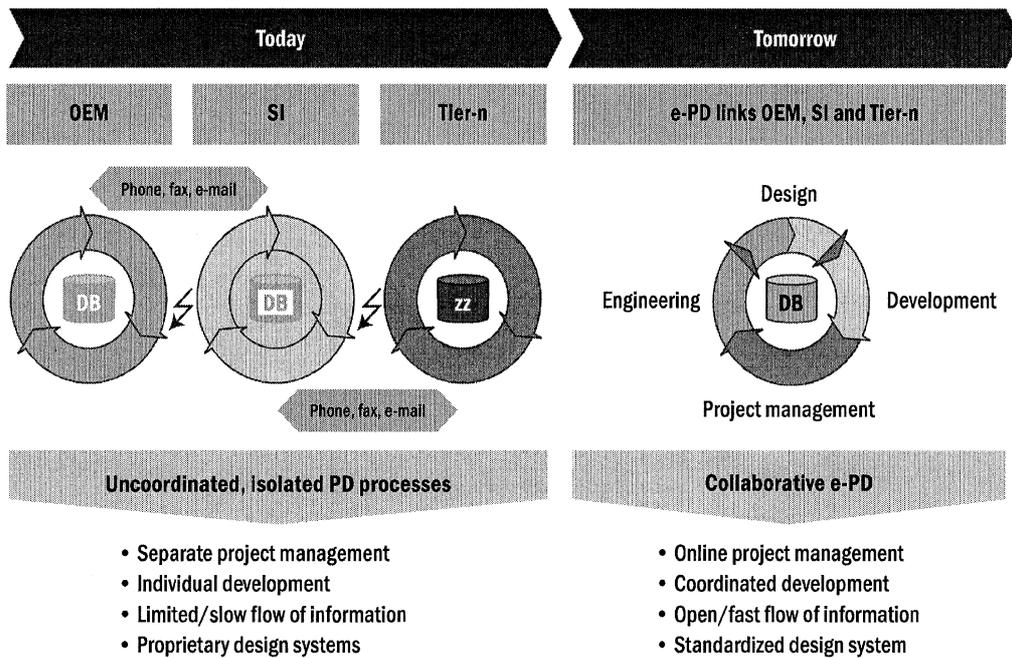
e-Enabled Product Development is one of the most important threads in the Automotive e-Business web. Forty-two percent of supplier interviewees feel that e-PD is the top e-Initiative their company should focus on this year. As OEMs transition engineering responsibilities to their System Integrator and Tier One suppliers, product development and innovation become increasingly important. We believe that the deciding factor regarding the speed and direction of e-PD in the industry is the pull from the OEMs. However, the way System Integrators approach the subject will largely define their competitive advantage.

e-PD is the top e-Initiative companies should focus on this year.

The features of e-Product Development

e-Enabled Product Development can incorporate a broad range of different tools, including web-enabled CAD/CAM, online project management, 3D design, and product data management, to name but a few.

e-Product Development is a fundamental thread to drive efficiency improvements in the development process



These tools create an impact both internally, where companies focus their e-PD initiatives on improving the flow of data within the firm, and externally, where System Integrators utilize collaborative design capabilities to interact with both their customers and their suppliers. The internal aspect is where the most immediate gains will be made. However, the external aspect has long-term competitive implications.

The study results suggest that the major beneficiaries of e-PD will be the companies at the top of the supply chain. Those interviewed believe that approximately 70 percent of the overall benefits will go to the OEMs and their direct suppliers. We feel that this view does not sufficiently recognize that the competitive pressure will ultimately push most of the benefits to the vehicle purchasers.

Approximately 70 percent of the overall benefits will go to the OEMs and their direct suppliers.

System Integrators' role in e-PD will be defined by their response to the four key industry tensions:

1. The transparency dilemma: How much data should I share with my OEM customers?
2. The standardization dilemma: Should I use proprietary or standard networks?
3. The business case dilemma: How can I justify the investments?
4. The question of power balance: Will these investments help me determine my own fate?

1. The transparency dilemma

The real benefits from e-PD come from the sharing of data between suppliers and customers. However, because complete transparency would force System Integrators to share the proprietary knowledge that gives them negotiating power with their OEM customers, we do not foresee SIs and OEMs entering into such open relationships.

The development of mutually beneficial alliances is almost unanimously praised as the best available model for SI/OEM relationships, based on the belief that long-term, stable alliances are best for fostering a sense of security and encouraging SIs to work above and beyond what is specifically called for in the contract.

However, most of the SIs interviewed worried that the OEMs could pursue "market-based" relationships, where the SI is kept at arm's length. These relationships are only as strong as the System Integrators' next bid.

While the concern about the relationship drives the transparency dilemma, the detailed discussion is focused along three dimensions:

- > **Intellectual property rights:** Sixty percent of the interviewees mention concerns about the security and confidentiality of their proprietary data. If SIs contribute to complete transparency in the product development process, they could lose control of the know-how that allows them to offer additional value to their customers and creates their distinctive bargaining position. The incentive is for System Integrators to maintain some portion of their data behind their own firewalls.
- > **Data security:** Even if System Integrators trust their OEM customers not to abuse their intellectual property, there is a real fear about system designs and data “leaking” to the competition. As one interviewee put it, “if we put our product development files on the web, we will be the target of every hacker from here to Timbuktu.”
- > **The commodity threat:** There is a fear that the transparency around e-PD will hasten the process of commoditization for System Integrators. As it is, System Integrators are struggling to stay ahead of the curve. Transparency threatens to make that task more difficult. One interviewee mentioned, “anytime people become too knowledgeable, the know-how becomes too highly spread and quickly turns into a commodity.”

2. The standardization dilemma

Although considered the silver bullet of e-Product Development in the automotive industry, we do not believe that system standardization is the savior many in the industry think it is. Our interviews show that there is a clear contradiction: companies want standardization for using external data, but want proprietary systems for their own data. The primary hurdle for standardization is the belief that proprietary product development systems offer companies a competitive advantage.

- > **They want it but ... :** Everyone in the industry speaks about wanting system standardization. The majority of those interviewed mention lack of standardization as a key barrier to e-PD. However, the same companies still feel there is a competitive advantage to their proprietary systems. The interviewees feel that in the future much e-PD will still be done on proprietary networks. As one OEM interviewee put it, “there is still a debate about whether having your own CAD system is a competitive advantage or not.”

Technology defines what is possible for specific functions in the industry. Until a technology is developed that creates a compelling reason to adopt a standardized system – combining integration abilities and security – proprietary networks will be the norm. While some vendors report that there are now

The major concerns: intellectual property rights, data security and the “commodity threat.”

A clear contradiction: companies want system standardization for using external data, but want proprietary systems for their own data.

suites available that can tie together multiple e-Business applications to create a relatively seamless system, the industry remains skeptical.

- > **There is no central driver yet:** For the OEMs who have set up proprietary networks there is little desire to create industry standards. However, the emergence of a powerful third party such as Covisint might create an industry standard, overcoming the reluctance of the OEMs. In an environment where economic resources are scarce, it is unthinkable for System Integrators to repeat the CAD experience. The initiatives that Covisint is rolling out will play a major role in defining the timing and the extent of standardization. Covisint has the largest window of opportunity, but if they cannot capitalize on it, one of the large software providers could end up defining a standard that the industry supports. Standardization could conceivably happen in the lower tiers first. At that level few suppliers are tied to any e-PD system or have enough resources to implement e-PD on their own.

We believe that by achieving critical mass with the lower tiers, Covisint could conceivably drive standardization throughout the industry.

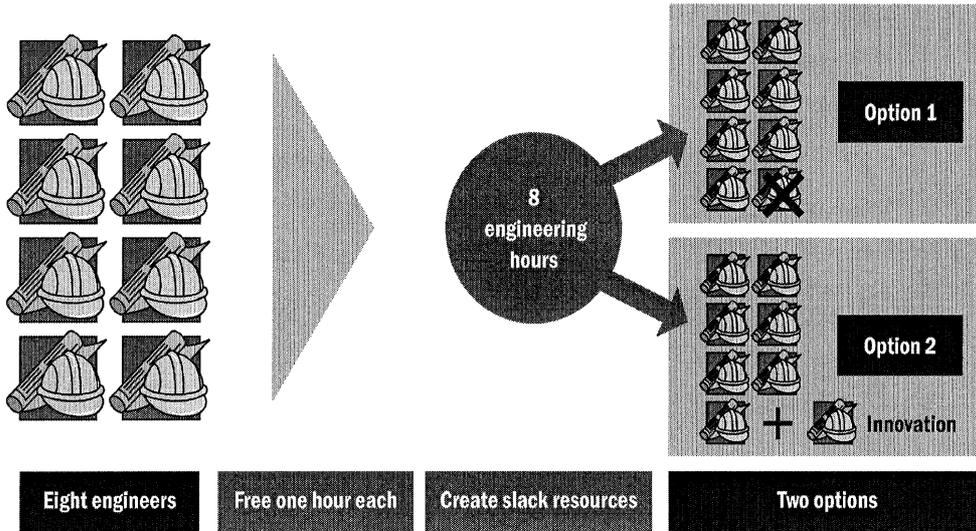
3. The business case dilemma

Making a business case is not necessarily a central issue for e-PD initiatives because, in many cases, it is the OEMs that are requiring their SIs to become e-PD enabled. Refusing to implement those initiatives is not an option. In addition, most System Integrators are able to make – at least intuitively – their e-PD business cases purely on the basis of the cost reduction potential. The additional value potential is understood, but it is not necessary to quantify it. However, in the interviews, the anticipated benefits of e-PD are split between increasing value – 21 percent – (e.g., increased global collaboration and increased innovation) and decreasing cost – 70 percent – (e.g., decreasing development time and decreasing hard costs), suggesting that System Integrators are looking at both value added and cost justifications. The interviewees mentioned four primary benefits from e-PD.

- > **Increased global collaboration:** Most of the respondents feel that a major benefit of e-PD will be the increased ability to collaborate globally on product development. Most interviewees feel that System Integrators with a large international presence will be the first to achieve significant benefits. By standardizing their product development operations around the world, they can create processes to facilitate global collaboration. Once these internal global processes are in order, System Integrators can apply the skills and tools to external collaboration.

System Integrators with a large international presence will be the first to achieve significant benefits.

The business case for e-PD can be made two ways: cost savings from reducing engineers or value creation by increasing innovation



Source: OSAT; Roland Berger – Strategy Consultants

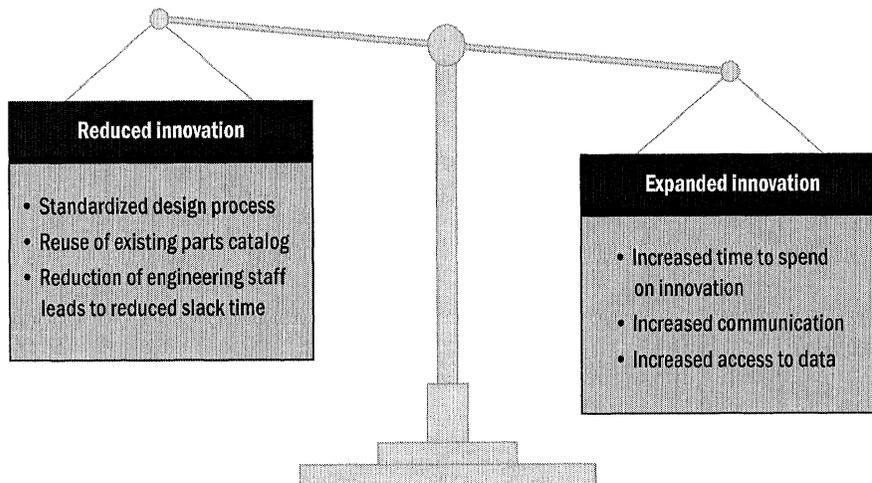
> **Increased innovation:** Two-thirds of the interviewees feel that e-PD would expand product innovation. Since e-PD will decrease the amount of time required for product development, the excess time will be funneled into new product innovation. Increased communication and faster access to data also increase the likelihood of a “eureka” moment. However, several interviewees worry that e-PD might actually decrease product innovation. The primary concern is that e-PD will standardize the design process in such a way that creativity will be taken out of the system and that there will be an incentive to reuse parts instead of developing new, innovative solutions. In addition, if System Integrators use e-PD to cut their engineering staff, they will eliminate the slack resources necessary for innovation.

e-PD will expand product innovation.

> **Time savings:** The interviewees estimate time savings from 20 percent to 50 percent of overall product development time by 2004. This will enable suppliers to reduce product development from the current 24 to 36 months to 12 to 29 months. The time savings will come from engineering team members being able to work on designs simultaneously, since data can be better managed through a central database on the project web site. Communication will be improved, helping eliminate wasted design efforts. Online connections also allow for an increased visibility of design changes. When the changes are visible, everyone in the supply chain can react to them quickly.

Time savings from 20 percent to 50 percent.

If managed correctly, e-PD has the potential to increase innovation



Source: OSAT; Roland Berger – Strategy Consultants

> **Cost savings:** Cost savings are the most prominent element of e-PD. The interviewees estimate that implementing e-PD could on average reduce product development costs by 10 percent to 25 percent. The cost savings will come from the overall reduction in development time, the reduction in the number of engineer hours required for a specific development project, the increased reuse of existing designs and a reduction in the number of prototypes required. Most of these cost savings are expected to be “soft cost” reductions, meaning that while the company might save costs on a specific project by improving the development efficiency, those costs would not actually come out of the company’s expenses. “I don’t see e-PD reducing the number of engineers we have,” is a frequent response of the System Integrators interviewed. Surplus time will be focused on the value opportunities of improving product design and innovation.

Most cost savings are expected to be “soft cost” reductions.

4. The question of power

The wide agreement among suppliers is that there has been a shift in the balance of power from the OEMs to the System Integrators. As OEMs have transferred the responsibility for system design and engineering, they have weakened their capabilities to execute those systems in-house. This gives the System Integrators a little more control. The thought among the interviewees is that “he who controls the engineering, has the power.” While the OEMs are not likely to give up power voluntarily, the shift towards outsourcing is causing it to happen anyway.

Fifty percent of those interviewed feel that e-PD will shift power to the System Integrator, while 46 percent believe that it will not have an impact one way or the other. No one interviewed sees e-PD as helping the OEMs gain power.

Fifty percent of those interviewed feel that e-PD will shift power to the System Integrator.

Based on our interviews, there is a disconnect between System Integrators and OEMs about how important SI efforts will be in guiding the development of e-PD. The SIs feel they will be extremely important in defining e-PD for the automotive industry. On the other hand, the OEMs feel that System Integrators will be only somewhat instrumental in shaping the initiative. This difference in beliefs is an example of how the players view the balance of power.

System Integrators see e-PD as a way to gain more power from their OEM customers. However, OEMs see e-PD as offering a chance to maintain the control that they have. As one OEM stated, “transparency allows us to delegate responsibility, but to keep control.” It is a concern among the System Integrators that the OEMs will want to transfer 100 percent of the responsibility for system design and manufacture, but only a much smaller portion of the authority to make design and sourcing decisions. This will limit the shift in power to the SI.

We would go one step further and say that e-PD could allow OEMs to regain some of the control they have already transferred to System Integrators. The transparency offered by e-PD gives OEMs a chance to manage the engineering process to a finer degree than they have done in recent years. The OEMs we spoke to understand this opportunity, but the SIs do not see it yet. If System Integrators do not recognize the threat, they could be overtaken by it.

e-PD could allow OEMs to regain control.

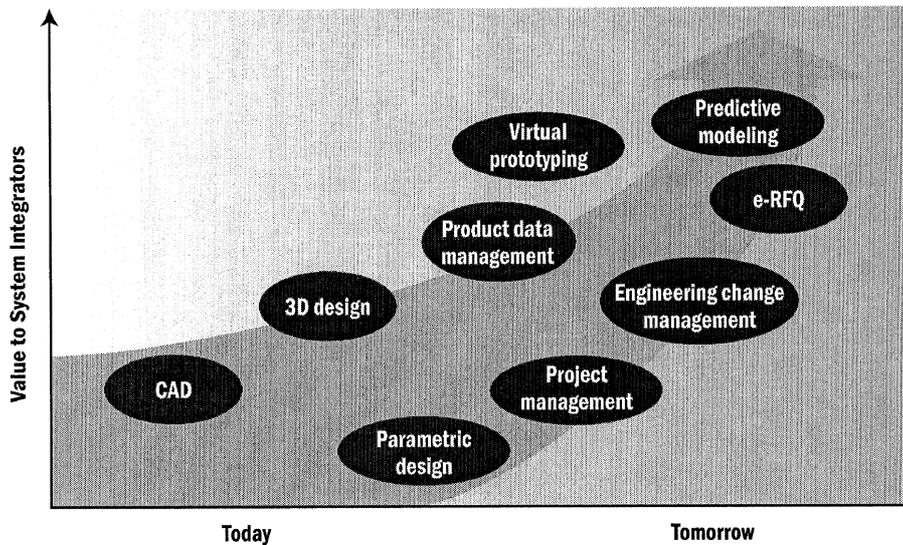
In any scenario, there is general consensus that the lower tier suppliers will lose power. However, the interviews show that lower tier collaboration is very important for System Integrator success in e-PD. Without lower tier support, SIs will not be able to maximize the efficiencies promised by e-PD.

The route to e-PD

e-Product Development is not a single tool. Instead, it is a chain of tools, platforms and processes that will lead to better integration and efficiencies in the design process. e-PD cannot be accomplished as a single “big bang.” Instead, tools should be implemented one step at a time, based upon the value, the cost and the time required.

There is no standard recipe for e-PD implementation. The steps a System Integrator takes will depend on where it is starting out. However, there are basic tools and features that a complete e-PD system will require:

There is no standard recipe for e-PD implementation.

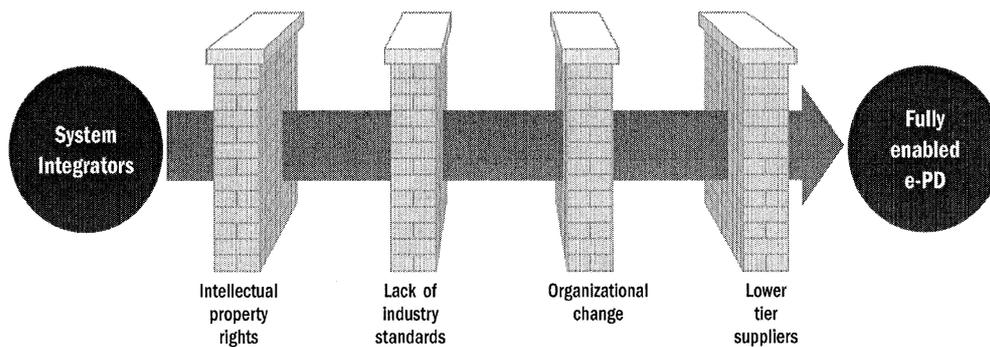
e-PD is a chain of tools and processes leading to improved integration and efficiency


Source: OSAT; Roland Berger – Strategy Consultants

- > **3D design:** 3D design and digital mockup tools are one of the first areas to focus on for e-PD. These are the tools that allow individual engineers to be more efficient. They also help cut the overall costs of the initial designs. Visualization tools and Product Data Management systems should be closely linked to gain the most benefit from the data that are captured and exchanged by both sides.
- > **PDM tools:** Product Data Management is another implementation step. These systems allow System Integrators to manage and maintain all the documentation related to their products and designs. They are the first step in creating an interactive collaborative design environment for all engineers working on a project, allowing for the creation of product catalogs and the instant updating of product designs and specifications worldwide.
- > **Project management tools:** Project management tools are also an essential element for e-PD. The visibility offered by these tools allows the customer to feel comfortable with the System Integrator's product development process. By making the process, if not the contents more transparent, the OEM may become increasingly at ease and willing to give more authority to the SI.
- > **Engineering Change Management tools:** Engineering change management systems are also linked closely to PDM and BOM. Using digital tools to drive ECM process will accelerate visibility and communication of design changes to all the stakeholders including the supply chain.

- > **e-RFQ tools:** System Integrators want to move away from having to create and respond to paper Requests for Quote. e-RFQ tools allow SIs to create and manage their quote processes electronically. This is expected to substantially reduce the time and effort necessary to respond to requests from OEMs and to create requests for the lower tiers.
- > **Virtual prototyping tools:** Virtual prototyping allows engineers to create digital mock-ups without the costs and time associated with creating a physical model. One of our interviewees estimates that virtual prototyping would allow his company to take 50 percent out of the prototype budget.
- > **Predictive modeling tools:** Predictive modeling allows companies to analyze part performance and significantly reduce costs associated with hardware testing. Related to virtual prototyping, these tools allow designs to be created electronically and then tested as if they physically exist. Predictive modeling will have some limitations, hence there will always be a need for physical models, but it can greatly reduce the quantity required.

There are four formidable barriers to creating fully functioning e-PD in the automotive industry



Source: OSAT; Roland Berger - Strategy Consultants

In spite of the challenges, e-PD provides a major opportunity for System Integrators. By preparing to take advantage of the benefits e-PD tools offer, they can gain a first mover position that will be a source of competitive advantage and help set the standard that will be followed by the rest of the industry.

In spite of the challenges, e-PD provides a major opportunity for System Integrators.

The SystemCo case study illustrates how System Integrators can implement e-PD. The case is reality-based, but the company name has been disguised.

The virtual factory as the endpoint of the industry efforts in e-PD is a quite consistent vision among our interviewees. How to get there is much less clear. Difficulties such as the size of investments, the changes – especially cultural ones – required by the organization, security concerns and the lack of standards are enough to slow down the process or even to cause management to take a “wait and see” attitude. SystemCo, a large System Integrator, has taken a down-to-earth, pragmatic approach to move forward and to avoid being caught off-guard by one of its customers or a competitor.

The keyword for SystemCo is “building blocks”: taking gradual steps to enhance the potential of the technologies already in use and to build confidence and familiarity within the organization.

Although CAD and PDM are daily tools, and Parametric Design is no longer a novelty, SystemCo realizes that technology is not enough when the tools are disconnected and if the organization is not ready to really make the most of collaboration: a cultural change needs to take place. People need time to adjust.

SystemCo is focusing attention on creating this new culture, starting from the basics, such as the use of net-conferencing, general collaboration and project team websites. The company started internally first, and is now working on pilot applications to bring in its own suppliers.

The sequence of the next “building blocks” for SystemCo has not been disclosed, but e-RFQ is one of the areas where it will place a lot of attention in the near future.

The weakest link? According to SystemCo, Web-enabled tools do not yet work well in connecting the supply chain. For example, if a part is changed at assembly, that change is not automatically passed to the supplier, so the tooling is not changed and the part continues to be produced incorrectly.

**Case Study:
SystemCo and the
route to e-PD**

**Technology is
not enough when
the tools are
disconnected.**

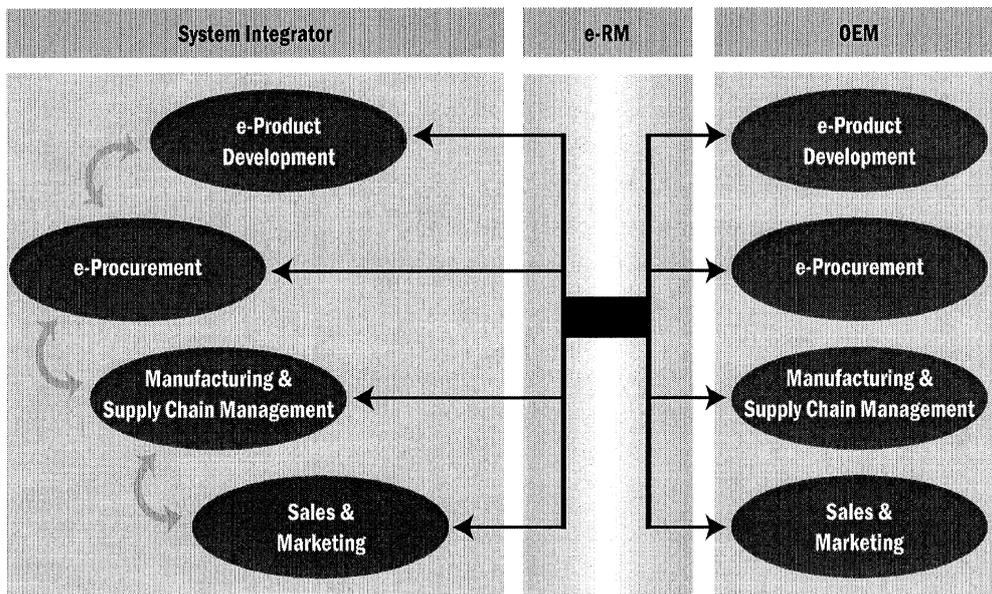
D. Building the invisible thread: e-Enabling Relationship Management

e-Relationship Management – using e-Business tools to improve the traditional RM approach – is the “invisible” thread of the e-Business web. It is an effort that will create efficiencies and value from all levels of a System Integrator’s interactions with its OEM customers. One System Integrator said, “we see RM across the entire map. There are several touchpoints: engineering, marketing, purchasing, plant floor production control, and logistics.”

“We see RM across the entire map.”

e-RM is the platform that links a System Integrator’s other e-Business systems together in a single customer focus.

e-Relationship Management is the key link between a System Integrator’s functions and its customers



Source: OSAT; Roland Berger - Strategy Consultants

While System Integrators may interact with a limited number of OEM customers, the quantity of interactions, in terms of the number of people involved, and the value of those interactions are actually very high. Having a window on this flow of information is a way to limit miscommunication and to increase the synergies from these multiple levels of contact. Because of this, we believe that e-RM will become the platform linking all of a SI’s e-Business initiatives together. e-RM will capitalize on the SIs’ existing knowledge and relationship channels, using electronic tools to increase the efficiency of the interactions.

We feel that e-Relationship Management will become increasingly important to System Integrators. However, in spite of its high potential, the industry has not yet adequately analyzed e-RM. The reasons for this include the fact that the OEMs have not mandated e-RM and that it is difficult for System Integrators to see the monetary benefits that it can generate.

e-Relationship Management will become increasingly important to System Integrators.

The features of e-Relationship Management

One of the problems with e-RM is that it can be defined as many things, from simple contact management to full knowledge-management systems. Because it is not one of the “easy” e-Business tools to justify or implement, it is not currently in the forefront of System Integrators’ efforts. One respondent, reflecting the view of many System Integrators, said “we are currently wrestling with what e-RM means for us.” Still, there are several potential features of an e-RM system that will bring both cost reductions and value creating opportunities to System Integrators.

The primary feature of an e-RM system is that it creates a global link for the data that System Integrators have relating to contact management, knowledge management, product development, procurement and supply chain management. Integrating all these data pushes System Integrators to streamline and coordinate their internal processes and to shape the organization around a single customer focus.

To implement effectively e-RM, System Integrators need to define their response to the four e-Business tensions:

1. The transparency dilemma: How much data should I share with my OEM customers?
2. The standardization dilemma: Should I use proprietary or standard systems?
3. The business case dilemma: How can I justify the investments?
4. The question of power balance: Will these investments help me determine my own fate?

1. The transparency dilemma

The interviews show that for e-RM to work, System Integrators must have all the information about their customers and products available in a central location. Data sharing becomes an issue both internally and externally.

Internally, System Integrators have to overcome the silo mentality of the various functions and divisions. In addition to the natural tendency to shield data, a major internal hurdle is the lack of standard systems and processes that makes

sharing difficult, if not impossible. A further layer of complexity is that System Integrators will have to appropriately shield information internally, to keep the data from different OEM customers from mixing and ultimately leaking.

Externally, resolving the transparency dilemma requires developing a complex set of filters and firewalls to define who has access to which sets of data. Some processes, such as order tracking, will be open, while others, such as product development, will be more heavily shielded.

Therefore, the development of a transparency solution falls into two tasks. First, SIs must identify what data are shared internally and second, what data are shared with the customer. The result is that for e-RM, there will not be a seamless, transparent flow of information but rather various flows on an as-needed basis.

For e-RM, there will be various flows on an as-needed basis.

2. The standardization dilemma

System standardization for e-RM is primarily a matter of translation. The goal is to get data into central data warehouses and to create the software that allows those data to be viewed by whoever needs it in whatever format is required. As with data sharing, standardization has internal and external aspects.

- > **Internal:** System Integrators need to gather the data for their e-Relationship Management in consistent formats worldwide. To do this, they need to create standardized tools and procedures. Since many SIs have grown through acquisitions, they are dealing with several different systems and processes, particularly sales and marketing. Implementing e-RM is a way to rationalize them. However, there are major hurdles. As one SI stated, "we have 12 or 13 different ERP systems and a decentralized organization. We can't afford to completely change everything."
- > **External:** There seems to be little additional value to be gained from industry standards for e-RM. In fact, proprietary e-RM systems should become a competitive differentiator for System Integrators. What SIs need to do is present the data to the OEMs in whatever format the customer requires. The advantage will come from how well the SI's system allows the OEM to interact with the data. One risk of this "proprietary" approach is that a third party may be able to create a standard, taking the potential to add value away from the System Integrators.

The key to system standardization is that the standards that evolve should be based around how to do transactions, not on specific applications or software providers. This allows System Integrators to adopt software and applications that may give them a competitive advantage, while still meeting the interoperability requirements of the OEMs.

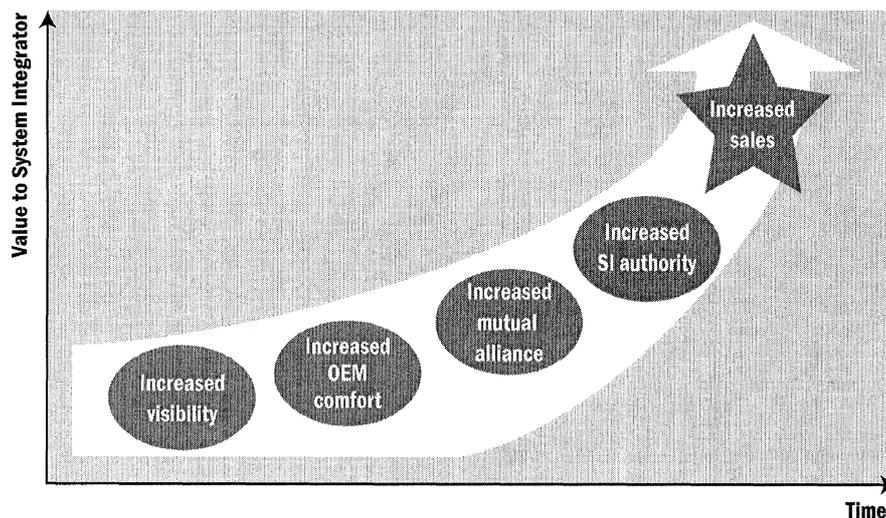
Standards should be based around how to do transactions.

3. The business case dilemma

Relationship Management (RM) is critical for both System Integrators and their OEM customers. Ninety percent of System Integrators and one-hundred percent of OEM respondents feel that RM-initiatives are important to them.

In spite of this, it can be difficult for SIs to make a business case to e-Enable their investments in this area. First and most importantly, the customer is not demanding e-RM solutions. Second, there are few obvious hard cost reductions to achieve with e-RM. Most of the benefits for System Integrators from e-RM initiatives are soft cost reductions and value-adding opportunities. These are often difficult to translate into hard dollars.

e-RM provides a sequence of benefits that will ultimately lead to increased sales



Source: OSAT; Roland Berger - Strategy Consultants

In the interviews, five items were consistently mentioned as value-adding opportunities provided by e-RM implementation.

- > **Faster data access:** e-RM will make it easier for SIs to respond to OEM requests, giving OEMs access to "on-demand" information that is not achievable today.

-
- > **Better contact management:** e-RM tools will also permit better contact management, that is, keeping more accurate and timely records on which OEMs and which OEM representatives are contacted, by whom, at what time, and for what purpose. OEMs are also interested in this issue. One respondent said, "visibility on all levels of inter-company communication will be a great benefit. Our SIs talk to us on a thousand different levels. It would be great to know who is talking to whom on what." The increase in the flow of information will also help suppliers and their customers avoid working at cross-purposes.
 - > **Improved customer satisfaction:** With the process standardization in place, many interviewees said that e-RM should make it easier for OEMs to do business with the System Integrators. The result is that the OEMs will likely do more business with SIs that have e-RM. The same is true across the value chain. A good e-RM system will make it easier for lower tiers to do business with their SI customers.
 - > **Better warranty tracking:** Warranty is an area where OEM vehicle customer data are important to SIs and e-RM data flow can facilitate the flow. As the System Integrators are required to assume more of the costs of warranties, they will need more information from the OEMs about claims. Streamlining the communication system will help eliminate the lag time in warranty data flowing to the SIs allowing them to make production changes more quickly. Our earlier report suggests that a 10 percent reduction in warranty costs through e-Applications is possible.¹
 - > **Improved forecasting:** Several respondents mentioned that if there were increased transparency in the flow of information, OEMs, System Integrators and the lower tiers would be able to create more accurate and realistic forecasts. Our earlier work suggests important hard cost savings can be estimated from improved forecasting and communication: a two percent productivity improvement, a 10 percent reduction in scrap and rework, a 20 percent reduction in inventory, and a 10 percent reduction in transportation costs.²

4. The question of power

System Integrators can take two approaches to e-Relationship Management that will help define whether they become spiders or flies in the e-Business web.

¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

² Ibid.

- > **Proactive:** System Integrators can start now to build e-RM systems which meet their needs internally, but which can also be used as a differentiating factor with their OEM customers. By using e-RM to link more closely and effectively with their OEM customers, SIs can move the power levels between them and the OEMs closer to a balance, and not be forced to simply do the bidding of the OEMs.
- > **Reactive:** Some System Integrators are taking the approach that e-RM does not offer any hard benefits to them. One SI respondent said, “we do not see pull signals from the customer. Otherwise, it would be easier to build a business case.” If System Integrators wait to react to industry demands, they could lose power on two levels. First, if the OEM sets the standard and requires participation, the SI will lose some ability to influence the balance of power in the relationship; and second, if a third party develops an e-RM standard, it could take the value-adding potential for itself that the System Integrators should develop themselves.

Most OEMs and System Integrators report that they have not thought much about e-RM. Therefore, it is an area where the SIs can step in and take the lead. Doing so will help them set the rules and shift the balance of power in their favor.

The route to e-RM

The OEMs are not yet calling on System Integrators to adopt e-Relationship Management tools. While the customer might not be asking for it today, being able to provide e-RM services could create a competitive advantage and significantly increase a System Integrator's value opportunities.

From the interviews, it is clear that there are a number of key steps that should be taken for e-RM and that there is a logical path to implement them.

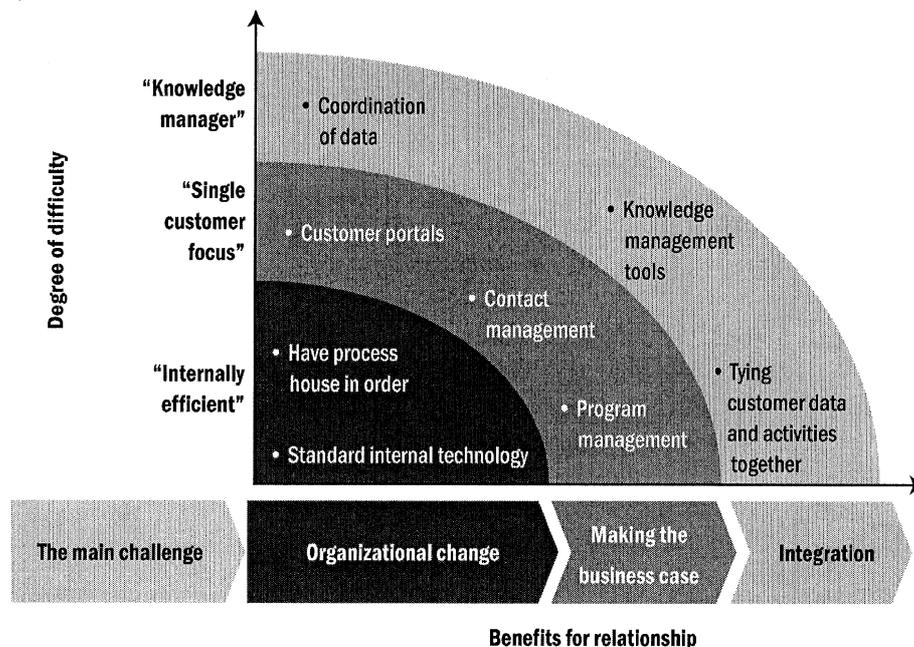
- > **Put your process house in order:** The first step in e-RM is for System Integrators to put their process houses in order. This means standardizing the sales and customer relationship processes throughout the company (not just in one division or region). This ensures that everyone is collecting the same data and doing the tasks in the same way and makes the technology easier to implement.
- > **Standardize technology:** As System Integrators have expanded internationally and grown through acquisition, their data management tools have grown unwieldy. Each SI needs to standardize the technology it uses, or at least create a standard data warehouse and translation utility to shift data among the different legacy systems.

By using e-RM, SIs can move the power levels between them and the OEMs closer to a balance.

e-RM is an area where the SIs can step in and take the lead.

The first step in e-RM is for System Integrators to put their process house in order.

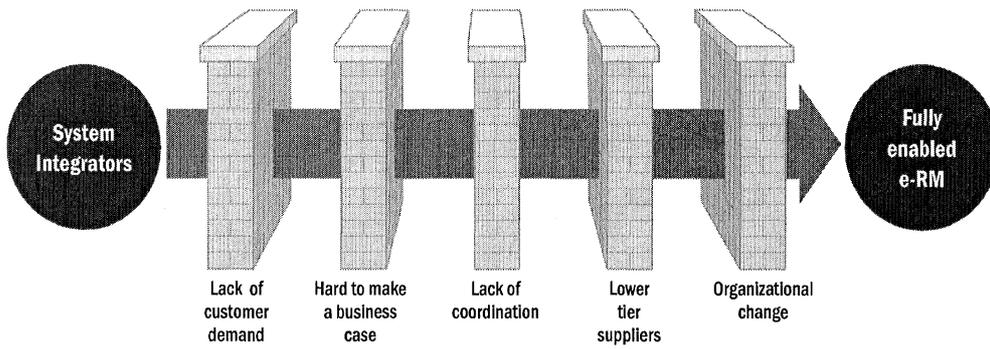
e-RM adoption will happen in phases, building upon different modules



Source: OSAT; Roland Berger – Strategy Consultants

- > **Contact management:** One of the aspects of offering a single customer focus is understanding how and on what level the SI is currently interacting with the customer. Contact management tools can be used to map and understand these interactions. They can also be used to drive synergies by linking key individuals and projects together.
- > **Program management:** Program management tools are central to the entire e-Relationship Management. If the current programs are not managed successfully, there will be no future programs to worry about managing. e-Enabling program management will help SIs increase the speed of data flow with their customers, and eventually reduce the number of fires that need to be doused.
- > **Knowledge management:** To create the e-RM platform that links the System Integrator’s e-Business web together, all of the OEM data must be linked and available. Knowledge Management (KM) tools are needed to create and manage this linkage. Some System Integrators are already using KM tools to increase the visibility of data within the company, but also with their customers.
- > **Electronic funds transfer:** Several System Integrators consider EFT tools as an important benefit of e-RM. The expectation is that these tools could have a positive impact on reducing errors, improving account reconciliation, and speeding bill payment.

There are five main barriers to successful implementation of e-RM for System Integrators



Source: OSAT; Roland Berger - Strategy Consultants

In spite of these challenges, a few System Integrators are already moving toward developing e-Relationship Management systems. Admittedly, they are doing so as a strategic investment. We feel that this is the right way for them to weave the web and not be snared by it.

A few System Integrators are already moving toward developing e-RM systems.

The IntegratorCo case study illustrates how System Integrators can proceed in defining what e-Relationship Management is and how it can be implemented. The case is reality-based, but the company name has been disguised.

**Case Study:
IntegratorCo and
the route to e-RM**

IntegratorCo, a large System Integrator with an international presence, found that consolidation was making its OEM customer base increasingly global. In addition, the company's own growth meant that it now had factories and sales offices in over 30 countries around the world. Thus, a Relationship Management system was necessary to ensure that the company was presenting "one face" to its customers worldwide. It launched the Global Customer Relationship (GCR) program to accomplish that.

The first step for IntegratorCo was to standardize its business processes and reporting methods worldwide. This was initiated in 1998 and involved building consensus among the various OEM customer-focused groups and international branches of the company. The new method has been utilized and evolved over the last three years. In addition to its processes, IntegratorCo put in place a global OEM business group philosophy. For each of its OEM customers, the company gave one office worldwide responsibility for key business strategies and decisions. For example, an OEM business group HQ office located in North America would be responsible for all key business strategies and decisions related to GM (NA) and its affiliate companies regardless of their geographic location – Saab (Europe), Opel (Europe), Isuzu (Japan), etc.

Even with standardized processes, the firm felt it still was not getting the maximum possible benefits and decided to overlay e-Business tools on top of the physical GCR to increase efficiency. Customer interactions were happening around the world. For example, an OEM account manager in South America would be expected to report information to the in-country office, the OEM business group HQ, and possibly to the corporate HQ – sometimes in different formats.

Once each report was prepared, it was faxed or e-mailed to the appropriate party. This often created redundant work and not all the appropriate areas of the company received information in a timely manner. The vision of having the raw data entered once into a single database, accessible to all, was expected to yield significant benefits.

In defining its e-Relationship Management tool for the GCR, IntegratorCo determined that the system's key feature was to capture data for 21 areas, including: contact information, meeting reports, technical presentations, customer forecasting ability, warranty information, quality information, and business/market information.

In developing the tools, IntegratorCo confronted all of the major e-RM tensions:

- 1. The transparency dilemma:** *IntegratorCo decided that the GCR was only to be used internally. Therefore, OEM customers would not be allowed direct access to the GCR data. Internally, there was also a sharing issue: There was not to be any cross-OEM flow of data between employees working for different customers. Apart from corporate strategy issues, worldwide sharing of data only happens within the OEM business groups.*
- 2. The standardization dilemma:** *IntegratorCo had the option to design a proprietary system in-house or to use a standard package off the shelf. For speed, functionality and cost, the company decided to use a standard package. The software it chose met 80 percent of its needs and required only 10 percent customization. The packaged software cost was significantly more economical than that of an in-house designed system.*
- 3. The business case dilemma:** *IntegratorCo felt that the biggest value of the e-Enabled GCR would be in qualitative benefits that could not be described in dollars. In spite of this, IntegratorCo was able to justify its GCR system solely on the basis of hard cost savings, converting some soft cost savings to hard dollars. By translating opportunities such as reduced faxes, phone calls, and the reduction of hours spent creating and tracking reports into dollars, the project was estimated to give an initial return of approximately 100 percent.*
- 4. The question of power:** *At this point, IntegratorCo does not see its GCR system shifting its power positions. However, it does feel GCR makes the company more valuable to its OEM customers by providing coordinated services worldwide and by improving the reaction time to queries and requests.*

Resolving the issues required building agreement among the regions, OEM business groups, and corporate headquarters. The result was a system that primarily benefits IntegratorCo and its international operations, as well as allowing the company to provide better/faster service to its customers wherever they are located. The company has had to work hard to plan its GCR system, primarily because it is on the leading edge of e-RM implementation and there are no industry benchmarks to guide it. There is still more to do: The company's leaders understand that people issues – training everyone to use the new system – will be a major task.

E. Rounding out the picture: A snapshot of e-Procurement and SCM

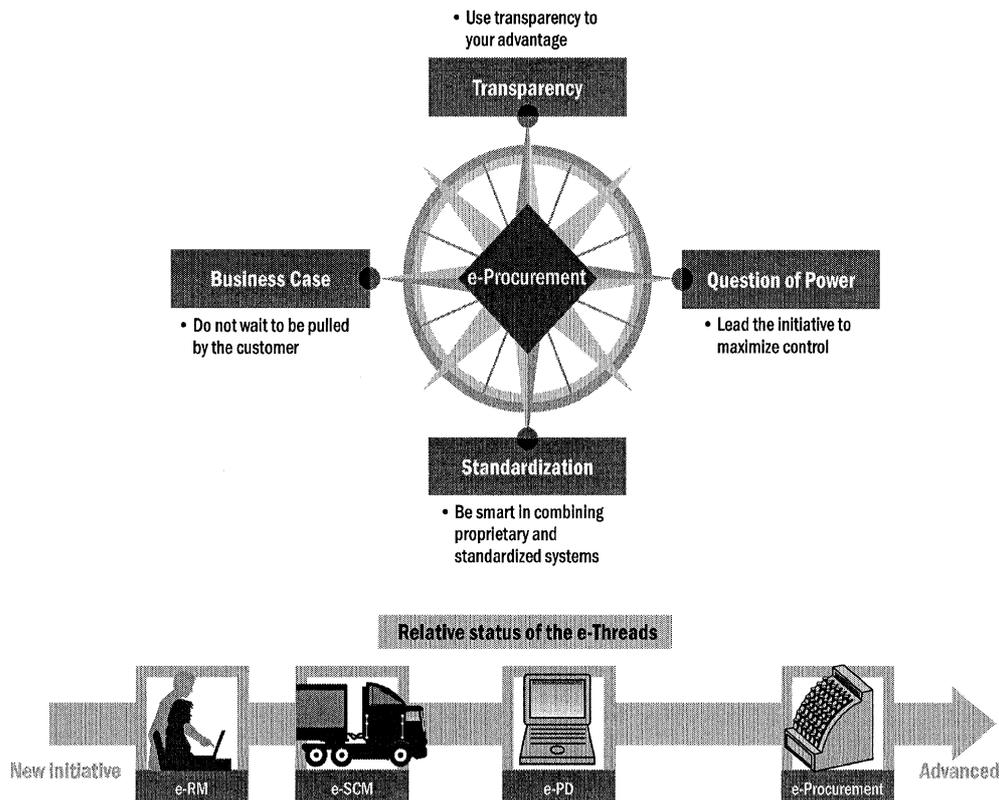
We deliberately focused on e-PD and e-RM as the major threads of the e-Business web. However, we recognize that at least two other e-Threads, e-Procurement and SCM, are central to automotive e-Business and are impacted by the four industry tensions. To complete the e-Picture, we include a brief overview of these two initiatives and how they are affected by the four tensions.

1. e-Procurement: The shape of things to come

Fifty-nine percent of our interviewees feel that e-Procurement is still the most advanced e-Business function. The reasons why it remains in front of the other initiatives are clear: there are tools available to implement it, it is relatively easy to conceptualize, and it promises (and delivers) immediate and real advantages and cost savings.

Interviewees feel that e-Procurement is still the most advanced e-Business function.

The experience from e-Procurement provides lessons that can be used as a navigation tool for the other e-Threads



One year into various e-Procurement initiatives, the industry has found itself moving along a learning curve: the realities regarding the limits to what e-Procurement can and cannot do have dampened the hype; mistakes have been made by both buyers and sellers; and e-Procurement tools are rapidly becoming more robust. e-Procurement has already faced the tensions that are confronting e-PD, e-RM and SCM. Because of this, it can serve as a guide to how those other web threads might be expected to advance.

The transparency dilemma

e-Procurement has made sharing data a central issue. Many SIs feel that reverse auctions force them to share too much proprietary data and are therefore unwilling to put their best technology out to auction. Indeed some System Integrators mention that they like participating in reverse auctions because it gave them visibility into their competitors' pricing.

Through trial and error, System Integrators have started to identify what types and levels of data they are comfortable sharing. If an auction is run for new technology, or the bid requires too much proprietary information, they may even decide not to participate.

The implication for other e-Business threads is that regardless of the OEM demands for transparency, if the System Integrator is not comfortable sharing the data, or feels that the requests infringe on its proprietary knowledge, it may walk away from the business. OEMs must be careful about what they ask for and how they ask for it.

The standardization dilemma

The standardization dilemma has not been fully resolved. However, two key trends are emerging.

1. Public (standard) exchanges are being used primarily for MRO and commodity products. System Integrators and OEMs feel that there is little security risk in conducting these transactions in a public forum on a standard exchange.
2. Private (proprietary) exchanges are still being used for high value, engineered parts. System Integrators and OEMs are wary about putting this information in the public domain, using standard systems. All OEMs are still heavily using their own proprietary systems and even some SIs have developed their own proprietary networks.

System Integrators have started to identify what types and levels of data they are comfortable sharing.

Public (standard) exchanges are being used for MRO and commodity products.

Private (proprietary) exchanges are being used for high value, engineered parts.

Again, the implication for the industry seems to be that System Integrators and OEMs will use public exchanges only in areas where they do not feel their proprietary knowledge is at stake. Data with a higher value will still flow through proprietary systems, even if a third party creates a powerful standard.

The business case dilemma

As is happening with e-PD, System Integrators were pulled into e-Procurement by their OEM customers. At least in the beginning, this reactive approach prevented them from actively defining the rules of the game. They became followers, forced to work within the system set by the OEMs. System Integrators began to take control once they started replicating the process throughout their own supply chain.

Only at this stage have they have started recognizing the value of creating opportunities of e-Procurement, such as decreasing the purchase cycle time, locating vendors internationally and helping take costs out of the procurement process.

The question of power

Because e-Procurement has been an OEM-led initiative, it is designed to maintain maximum power for the OEM. The level of information required, the pricing pressure and the expansion of the supplier pool all work in favor of the purchaser. System Integrators followed along reluctantly at first, but became more enthusiastic when they realized its potential for their own supplier transactions. So while SIs have ceded power to the OEM, they have been able to gain some power in the interactions with their own supply base.

The role of the third party has become evident in e-Procurement. Players such as Covisint and Freemarkets have emerged to facilitate e-Procurement interactions, standardizing them and making them more affordable for the lower tiers. By making e-Procurement easier for SIs and the lower tiers, these third parties are able to shift some control in their direction.

e-Procurement should serve as a warning to System Integrators about the dangers of not being proactive. If SIs wait until OEMs or a third party design the systems for e-PD, e-RM or SCM, the needs of the SI will likely be only a minor consideration. By being proactive, System Integrators have more opportunity to influence the balance of power and advantage.

SIs began to take control once they started replicating the process.

e-Procurement should serve as a warning to SIs about the dangers of not being proactive.

The route of e-Procurement

Regarding their overall e-Procurement goals, respondents feel on average that their companies are only 30 percent of the way toward achieving them. As with the other threads in the e-Business web, the approach each company takes to e-Procurement is particular to that company and its risk sensitivity. Some of our respondents plan on using auctions only for MRO and commodities, while others are setting up private exchanges to manage the purchases of complex engineered products.

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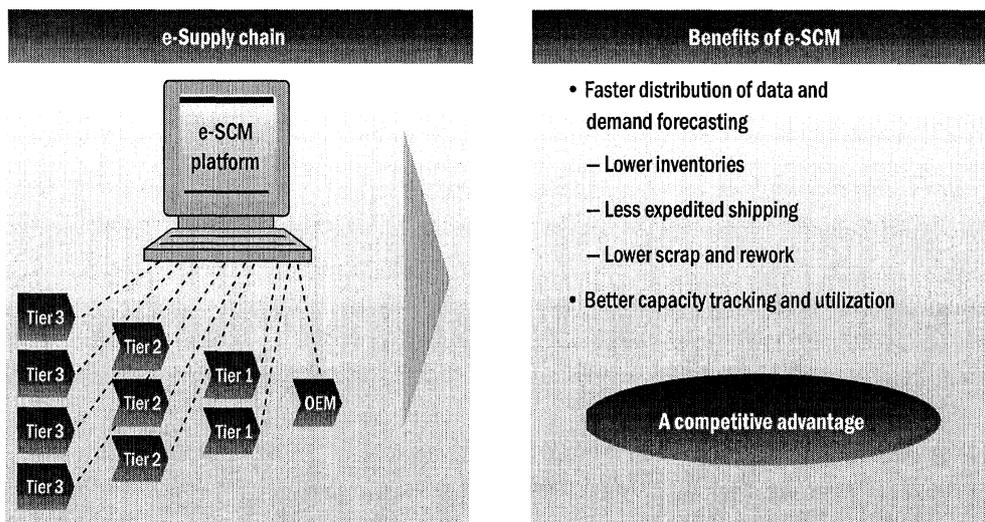
e-Procurement initiatives prove that e-Business tools in general are not a one-size-fits-all solution. The tools are available for everyone, but each player will use them in different ways to shape its own competitive advantage.

2. Supply Chain Management – a Herculean task

e-Supply Chain Management (e-SCM) has become the e-Business battlefield for the automotive industry. It is perceived as the e-Thread that will create the greatest efficiencies by eliminating waste and excess inventory. Our previous work¹ estimated inventory in the supply chain to be \$132 billion with potential savings from e-SCM estimated to be 20 to 40 percent of that total. Because of the money involved, e-SCM is seen, as one respondent said, “as the current Miss America of e-Business.”

e-Supply Chain Management has become the e-Business battlefield.

SCM is the current e-Business battlefield because of its potential benefits



Source: OSAT; Roland Berger – Strategy Consultants

¹ Automotive e-Commerce – A virtual reality check, Roland Berger & Partners and Deutsche Bank, June 2000.

The benefits

There are several benefits to e-SCM, including faster distribution of data and demand forecasting, and better capacity tracking and utilization.

The faster distribution of data and demand forecasts is critical to achieving the expected reductions in inventory. An added benefit is the reduction of expedited freight, which several interviewees mention as a large component of supply chain cost. Our earlier work estimates that in addition to inventory reduction, the hard cost savings that can be achieved from improved forecasting and communication are a 10 percent reduction in scrap and rework and a 10 percent reduction in transportation costs.¹

Better capacity tracking will allow System Integrators to improve the utilization of their supply chain, by leveling production across their suppliers and plants, having a positive impact on the logistics and production issues that currently affect the industry.

A major difficulty for e-SCM is the technology. However, an even greater hurdle is caused by e-SCM's strong implications for power. Whoever masters the supply chain will gain enormous control. This makes it difficult for companies to work together to develop e-SCM solutions and makes the key industry tensions all the more relevant.

The key tensions

All of the four e-Business tensions are strongly defined along the e-SCM web-thread.

- > **The transparency dilemma:** e-SCM offers the opportunity for all levels of the supply chain to be visible. If the OEMs have this visibility, they can effectively control the chain, allowing them to create efficient sequencing, and perhaps achieving "lot sizes of one." However, System Integrators want to shield those data from the OEM, giving them information only on a "need-to-know" basis because this serves to increase their power vis-a-vis the OEM and preserves their competitive advantage.
- > **The standardization dilemma:** In e-SCM, the standardization dilemma cannot be separated from the battle for power. Because excellent Supply Chain Management is thought to provide a strong competitive advantage, System Integrators will be tempted to create and preserve their own proprietary sys-

**Key e-SCM benefits:
faster distribution of
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utilization.**

**e-SCM offers the
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¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

tems. Not surprisingly, the biggest promoters of standardization in this area appear to be the OEMs, who see the opportunity to gain control of the supply chain through transparency, thus diminishing the negotiating power of the SIs. Security and safety of data is another key component of the standardization dilemma. System Integrators worry that supply chain data that is carried on standard systems has a higher possibility of being compromised. A third party such as Covisint can create a powerful e-SCM standard, but it must ensure the security of the data flowing through it. Covisint has a high technology hurdle to overcome, but an even higher hurdle is convincing the industry that it will remain neutral and that it has strong enough firewalls to protect its customers' data.

A third party can create a powerful e-SCM standard.

- > **The business case dilemma:** Strategic necessity, coupled with the expected hard cost savings of e-SCM mean that it is an initiative that System Integrators are willing to fund. There will be real benefits to an e-Enabled Supply Chain. However, e-SCM will not be cheap to implement. EDI was limited to Tier One/OEM relationships because of its prohibitive cost – especially if the supplier was linking to more than one OEM. Because of this, e-SCM is an area where a third party could create significant value. By creating an e-SCM solution that is affordable for the entire supply chain, a third party such as Covisint could develop an industry standard that the rest would follow. Covisint could make e-SCM a reality by making it affordable and allowing the less technologically sophisticated lower tiers to take part.
- > **The question of power:** As mentioned above, at its core, SCM is about acquiring and/or maintaining power. It is therefore a race that both OEMs and System Integrators are running very hard to win. If the OEMs and the SIs cannot create a standard, the door is left open for a strong third party to enter and capture the value from e-SCM.

SCM is about acquiring and/or maintaining power.

The challenges

As with all the e-Threads, there are several challenges associated with implementing e-SCM.

First, the industry does not yet have total faith in the technology. The tools are not yet strong enough to offer full e-SCM capabilities. Second, e-SCM will require substantial organizational change to implement. System Integrators must be prepared for the difficulties associated with training people on new tasks and with optimizing their processes. Third, for e-SCM to work, everyone, including the lower tiers, must be brought on board. This means that e-SCM tools must be affordable and that the lower tiers must be helped to see the value in it for them.

Our previous study suggested that e-SCM would be a longer-term project, with the time frame for implementing it likely to be 4 to 5 years. This still rings true today, although the emergence of a credible third party could significantly reduce that time.¹

e-SCM is a longer-term project.

In spite of the challenges, the battle for control of SCM is raging. Who will gain or lose control is still open for discussion. OEMs, System Integrators and third parties all have the opportunity to take advantage of the situation for their own benefit.

We believe that the most likely engine of e-SCM will be a third party. Outside of that, the players in the industry do not really have the motivation to adopt standards over their proprietary systems.

The most likely engine of e-SCM will be a third party.

¹ **Automotive e-Commerce – A virtual reality check**, Roland Berger & Partners and Deutsche Bank, June 2000.

F. A glance into the crystal ball: The future of the e-Enabled System Integrator

The study shows that it is not clear how the industry will resolve the tensions it is facing. Whether System Integrators can proactively shape their own role in e-Business is still an open question.

We expect success will come to the SI/OEM combination that really believes in the Supplier-Customer alliance philosophy. These are the organizations that focus on the value of the long-term relationship over the value of repeated market-selection of suppliers.

The difference between the two is that with the alliance philosophy, competition is still guaranteed, but it is not focused solely on price. Supplier attributes such as reliability, quality, and engineering capabilities play as great or greater a role in the OEM's decision.

In the repetitive market-selection model, supplier selection is made based primarily on price, with suppliers competing continuously to maintain existing business. OEMs and suppliers with an alliance philosophy will share a large portion of their data and will allow each other to make a reasonable profit on their value-added contribution. There will be a high level of trust between them and an increased willingness to work together.

But there will not be just one solution that fits all. e-Business will increasingly be used as a differentiating factor, and the way companies use it will differ as well. Ultimately, the web will be woven around a combination of alternative models with differing degrees of control.

> **One model will see SIs at the center:** System Integrators have the opportunity to become spiders in an e-Business web of their own design, if they act to influence the direction of the industry. This will require a thoughtful, balanced sharing of information: transparency is granted but limited when it affects critical know-how. To take their role at the "center of the web" SIs will have to have their own internal processes streamlined and standardized first, and will do so by investing in e-Business with a strategic approach.

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There will not be just one solution that fits all.

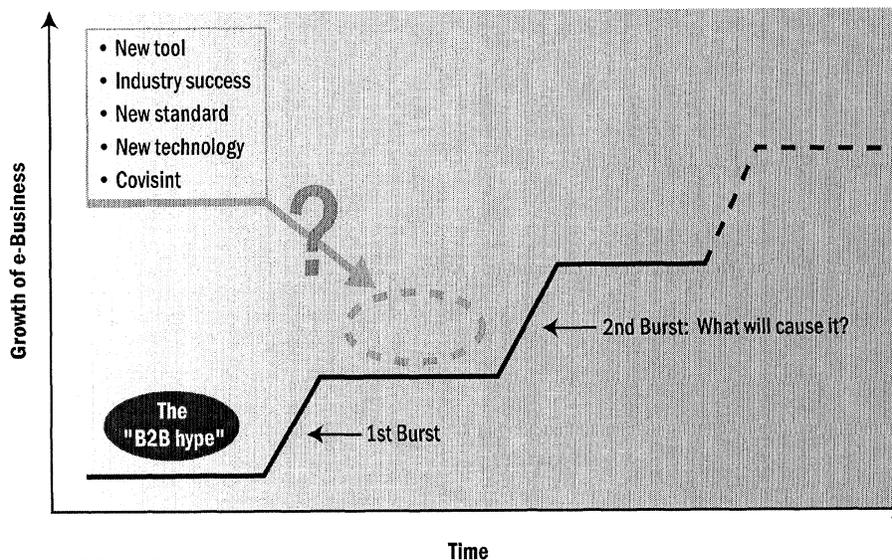
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- > **An opposite model can emerge, with SIs trapped in the web:** If System Integrators are not careful and fast, the decisions they make (or neglect to make) might force them to be just followers of OEM initiatives. This will develop if the prevailing kind of relationship moves away from the SI/OEM alliance model and might be triggered by an approach that promotes investments in the e-Business area that are solely justified on cost pressures or OEM mandates. The risk of this approach is that System Integrators follow the initiatives of their customers, repeat the pain experienced by multiple CAD systems, and basically comply with OEMs' decisions rather than proactively defining their own competitive advantage. The balance of power involved in this scenario is clearly weighted in favor of the OEMs.

 - > **A different, more radical model sees the emergence of a third party spider:** For the first time, technology seems to provide – at least in principle – the opportunity for a third party to emerge and create enough value for OEMs and System Integrators to gain a level of control over both and begin spinning its own web. The trigger could be a high level of standardization achieved by the industry through a third party's proprietary systems. The scenario suggests high volumes of data that are shared by OEMs and SIs, but captured or managed by the third party. The third party acts as a gatekeeper, ensuring the desired level of shielding between parties and providing brokerage of non-sensitive information. The long-term relationships are with the third party, not between the OEM and SI. They are both progressively reduced to making reactive investments in order to continue participating.

The theory of punctuated equilibrium, developed in another field, suggests that process change in e-Business will be made in "fits and starts," instead of a rapid and complete revolution, or a slow, steady evolution, e-Business will proceed in short bursts of intense change, followed by longer periods of slower and smoother development. The question is what will trigger those short bursts.

**The timing of change:
Punctuated equilibrium**

Several factors could drive the next burst of e-Business expansion



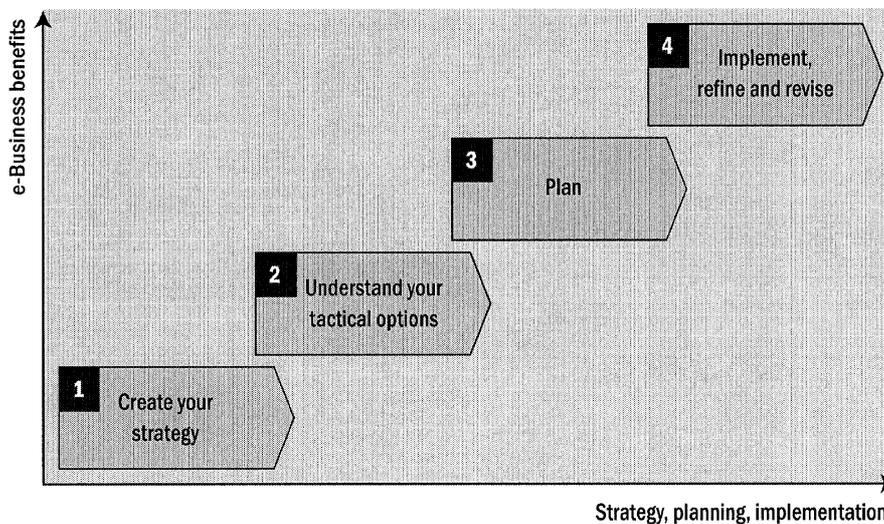
Source: OSAT; Roland Berger - Strategy Consultants

G. Don't get trapped: The roadmap for the e-Enabled future

e-Business can help System Integrators maintain an advantage over the competition and leverage their capabilities with their OEM customers. There are four key steps to successful e-Business implementation:

- > Create your reality-based strategy
- > Understand your tactical options
- > Plan
- > Implement, refine and revise

Four steps to creating a successful e-Business organization



Source: OSAT; Roland Berger – Strategy Consultants

How your company manages these steps will largely determine your future as an e-Enabled automotive supplier.

1. Create your reality-based strategy

The first step toward realizing your company's e-Business potential is to understand where your company wants to go. This should be done as a review of your company's overall strategy – where are you going, and how you plan to get there; the state of the existing business processes – are they optimized to the point

where e-Business can help them; the status of the IT infrastructure – is it robust enough to handle new e-Business requirements; and the people – do you have the right people to lead the charge for e-Business? Do you have senior management support?

Building the strategy should be based upon overcoming functional silos within the organization, being proactive in the development of new systems and offerings, and thinking holistically about the organization – how will one area be impacted (positively or negatively) by changes in another area.

Building the strategy should be based upon overcoming functional silos within the organization.

2. Understand your tactical options

Once you have decided how e-Business fits with your company's general strategy, understanding your tactical options – how to use e-Business to achieve that strategy – is the next critical task. Spending a portion of your time looking at what options are available to you – from potential e-Business projects, to possible solution providers – will allow you to move forward with those initiatives that make economic sense.

Understanding your tactical options includes doing cost/benefit analyses of the various e-Business initiatives and deciding which will work best for you. In looking at the costs, you must be sure to include the software and hardware costs, the training costs, recurring costs such as licensing fees, and annual maintenance costs. You also need to evaluate the various solution providers to understand what they bring to the table and whether or not they present any hidden surprises.

Understanding your tactical options includes doing cost/benefit analyses of the various e-Business initiatives.

3. Plan

Lack of planning is where significant, unanticipated costs of e-Business initiatives often develop. Spending considerable time and energy on up-front planning will translate into smoother and less costly project implementation. Planning includes all phases of the project, such as new organizational structures, new processes, IT systems, and employee training. The timeline for implementation and all other specific measures should be incorporated into an action plan.

Lack of planning is where significant, unanticipated costs of e-Business initiatives often develop.

The planning process should involve as many people within the organization as possible. This secures increased buy-in and identifies more ideas and potential problems ahead of implementation.

4. Implement, refine and revise

Once the planning has been done and everyone is ready, the process can begin. There are two stages to implementation: the pilot stage and the full-scale rollout.

The pilot is run to validate the functionality of the e-Initiative. It is used to shake out the system and to understand where potential problems are before they impact the whole company. As the system is validated, new products or functions are added. A success story is necessary for the project to take off (hence the need for good up-front planning). If the pilot fails, there will be little enthusiasm for continuing the initiative and for full-scale implementation.

The full-scale rollout is not the final stage. Once the systems have been planned and tested, and your employees have been trained, you can take advantage of your newly efficient processes provided you continually reevaluate and improve them.

You can take advantage of your newly efficient processes provided you continually reevaluate and improve them.

- > **Top management must initiate the process of change.** *e-Business is not just another IT project. It involves dramatically changing business processes, employee responsibilities and adjusting the entire organization. Without the explicit support of top management, it will not succeed.*
- > **Significant personnel and financial resources are required.** *While pilot projects can be implemented in a short time frame, transforming existing processes into e-Processes requires a long-term implementation plan. It is possible to reduce hardware and software investments through outsourcing or licensing, but investments in employee training and change management cannot be underestimated.*
- > **Apply the “80/20” rule.** *Focus the scope and function of any e-Business solutions to use out-of-the-box applications with limited customization. These measures ensure on-time project implementation and rapid realization of benefits.*
- > **Lower tier suppliers have a long way to go on e-Business.** *Many smaller suppliers are not able to participate in e-Business initiatives either because of the cost, or the lack of know-how. However, their involvement is essential. System Integrators need to coach their lower tier suppliers to bring them up to speed on e-Business.*
- > **Back-end systems integration is complex and time consuming.** *Despite improved interoperability of systems and standard communication protocols, the integration or replacement of your company’s legacy systems will require major resources. In addition, the challenges of maintaining existing databases and keeping data “fresh” should not be underestimated.*
- > **e-Business strategies should not be carved in stone.** *A constantly changing business environment, as well as technological innovations, requires your company to reassess continually your e-Business strategy, improving it and adapting it to evolving market trends.*
- > **The key to e-Business success is not technology, but employees.** *The best technical solution is worthless if your employees do not utilize it. Adjusting people’s work processes and organizational setting requires efficient change management and open communication regarding the benefits of the e-Business solutions.*

**Dos and don'ts on the road to “e”:
lessons learned from Roland Berger's experience**

This SupplierCo case study illustrates how suppliers can proceed in determining what their e-Initiatives should be and how to go about implementing them. The case is reality-based, but the company name has been disguised.

SupplierCo, a medium size tier one supplier, started down the e-Business road eighteen months ago. Three events prompted the company's move into technology: First, the customers demanded it; Second, Covisint seemed to make it easy and affordable; Third, the company hired an e-Business expert.

SupplierCo's approach

SupplierCo followed a five-step process to design its approach to e-Business and the initiatives it would implement:

- > *Define the goals/outcomes of the initiatives*
- > *Understand what can be done internally*
- > *Bring in outside help (if necessary)*
- > *Identify high potential projects*
- > *Use internal teams to implement*

1. Define the goals/outcomes of the initiatives

SupplierCo knew that it needed to do something quickly regarding e-Business. Management also knew that it had to approach the subject in a logical way. The first step was to form a steering committee, made up of senior management and having the buy-in of both the CEO and the COO. The committee set itself the goal of, within four weeks, defining the scope of its e-Business needs and how to meet those needs consistent with the overall strategy of the firm.

2. Understand what can be done internally

The steering committee conducted an internal audit to determine what the company could accomplish on its own. It looked at the level of technical staffing, how ready SupplierCo's infrastructure was and the number of things the committee wanted to accomplish. It was here that committee members realized that outside help could be beneficial.

"We had a long list of things we wanted, but we realized that we could not qualify why we wanted them, nor could we quantify what the benefits would be from getting them," said one of the steering committee members. The steering committee developed an RFP that was sent out to a number of consulting companies to help the company achieve its e-Business goals.

**Case Study:
SupplierCo – the
route to e-Business
implementation**

3. Bring in outside help

The decision to seek help was made after the committee reached the point where the company could really use such assistance, but before it got into trouble. Based upon the work of the steering committee, SupplierCo knew there were key items it wanted from a consulting engagement, including: identification of the greatest e-Business opportunities and a prioritization roadmap for how to get there, a rough cost/benefit analysis of each initiative, and an assessment of the company's readiness to implement the initiatives.

4. Identify high-potential projects

The cost/benefit analysis of the potential projects was very important to SupplierCo. With one strategic exception (the design of an external website), projects only went forward if there was a solid business case behind them.

Unfortunately, it was here that another issue emerged. The projects with the highest value typically had the longest time to implement and were also the most expensive. SupplierCo, with a limited IT budget, had to focus on several key initiatives that were both beneficial and affordable. To do this, the committee looked at strategic value, implementation costs, and impact on the bottom line.

5. Use internal teams to implement

There is no "e-Business Department" at SupplierCo. Instead, employees within the functional areas that have the most to gain by the implementation lead all the e-Business initiatives. For example, e-Procurement is led by purchasing, but has participation from accounting and engineering. SupplierCo felt that an e-Business department would just add another layer of management without adding a lot of value. Because the projects have management buy-in at the highest levels, support for the projects has not been a problem.

Where is SupplierCo today?

SupplierCo understands both its own limitations and the limitations of the technology that it is implementing. It is almost finished with its first e-Business phase. Even though the current business climate has forced it to put phases two and three on hold, key strategic projects such as PDM are still going forward.

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