Ford Mondeo: A model T world car?[1]

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[1] The conceptual base of this case study is described in much more detail in: Mol and Koppius (forthcoming).

Executive summary

This case weighs the advantages and disadvantages of going global. Ford presented its 1993 Mondeo model, sold as Mystique and Contour in North America, as a 'world car'. It tried to build a single model for all markets globally to optimize scale of production. This required strong involvement from suppliers and heavy usage of new information technology. The case discusses the difficulties that needed to be overcome as well as the gains that Ford expected from the project. New technology allowed Ford to overcome most of the difficulties it had faced in earlier attempts to produce a world car. IT was flanked by major organization changes within Ford. Globalization did not spell obvious success though. While Ford may in the end have succeeded in building an almost global car, it did not necessarily build a car that was competitive in various markets. The Mondeo project resulted in an overhaul of the entire organization under the header of Ford 2000. This program put a heavy emphasis on globalization although it perhaps focused too little on international cooperation and too much on centralization. In terms of Ford's own history, the Mondeo experience may not be called a new model T but does represent an important step in Ford's transformation as a global firm.

Background

An important stream of work in the area of international management (Prahalad & Doz, 1987; Bartlett & Ghoshal, 1989) is concerned with the location paradox: should an internationalizing firm be responsive to local circumstances or go for global integration? On the one hand global integration presents interesting business perspectives, because firms can offer a single product worldwide and use a very uniform way of organizing and producing based on standardized technology. On the other hand there are usually diverse demands being made on multinational corporations (MNCs) by their local customers, host governments or other parties. Managing the location paradox always requires balancing between the local and global perspectives.

In the most basic terms the advantages of being global are that firms obtain advantages of scale. Imagine if there was really only one global market for a firm, for example if customers demanded precisely the same car everywhere. A firm could build one, huge, factory from which it could supply the entire world, one marketing center, one R & D unit and so on. The costs per unit of production would be minimal. In reality we, of course do not have such markets, but there are certain products that benefit from being produced by international firms. Coca-Cola is a global brand and benefits from global advertising. However, the taste of the beverage varies regionally.

Given that most products are not global, surely there are advantages to being local as well. These are best summarized as 'being in touch' with the environment. Firms that operate locally can quicker or better react on customers, deal with local partners and governments and so on. An haute cuisine restaurant usually serves a local custom base and operates locally. Table 1 provides an overview of the advantages of being local and those of being global, as they were conceived by Prahalad and Doz

(1986) in their work on the integration – responsiveness grid. All tables can be found in the appendix.

Because local and global are two countervailing forces there will always be a tension between the two. Even for fairly global companies there is a need to act locally (consider what actions Coca-Cola needed to take when people in Belgium got sick due to drinking it) and no local company can completely ignore the forces of internationalization. However, the consequences of this tension for management policy may not be stable over time. Depending on the extent to which firms can unite the global and the local they are more or less successful in becoming a 'transnational' firm (Bartlett & Ghoshal, 1989). Transnational firms are able to manage the local and the global simultaneously and are thus believed to be able to achieve superior performance. In this light it is interesting to investigate further the consequences of introducing new Information Technology to a multinational firm. Information technology is thought to be on of the key drivers of globalization. Is IT indeed the stepping stone towards becoming a more global firm? Or, alternatively, does IT simply allow a firm to manage the tensions between the global and the local better, without changing the balance between the two?

This framework will be applied to the case of the Ford Mondeo[2], a car introduced by Ford in 1993 as a 'world car'. Ford Motor Company barely needs any introduction. It is of course known as one of the world's premier manufacturers of automobiles. Its cars have been sold all over the world for many decades now. Table 2 describes some of Ford's key financial data. A world car is a single car that is sold in different parts

[2] The Mondeo was the European version of the car. The North American names are Mystique and Contour. Because the Mondeo was built in the largest quantities, produced and sold earlier, it is generally referred to as 'the world car' by the business press but also by Ford itself. In the remainder of

of the world, although slight variations may be made to the model. The following three questions will guide the analysis and discussion of this case:

1. What were the advantages of going global with its Mondeo for Ford and what barriers did it face to do so?

Obviously Ford must have thought there were important advantages attached to producing the first ever world car. These globalization advantages will be discussed in the case in order to get an idea of the strategic motives behind this decision. On the other hand the automobile industry has always faced local constraints, for example in terms of traffic rules, that needed to be overcome. Therefore a delicate balance needs to be found and maintained between going global and operating locally. What kind of managerial challenge did Ford face here?

2. Was new IT the key enabler in establishing this global production and supply structure?

A world car poses new and possibly very different demands upon the organization and technology in use by Ford. Even if the parts going into a world car and the production technology are essentially the same with an ordinary car, a new logistics and communication structure is required to produce the car. From an IT perspective it is especially interesting whether it was the new technology that helped Ford to produce globally or other factors. It has often been suggested that IT is one of the key drivers of the process of globalization. Does the Mondeo case confirm this?

3. Has the Mondeo become the new 'model T'?

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the text the name Mondeo will be used to designate the entire world car project (including the North American models).

Ford attained much of its fame and present status from the highly successful model T, a car produced at a very large scale at the beginning of the previous century. The model T helped Ford to become by far the largest automobile assembler of the world at the time until its demise in the late 1920s caused a severe disruption to the Ford Motor Company. The world car concept inherent to the Mondeo presented a new mass scale production innovation. Was the performance of the Mondeo good enough to call it Ford's new model T?

Ford has always been one of the world's largest and most international manufacturers of cars. It was founded in 1903 and first produced abroad in 1904 in Canada and expanded intercontinentally in 1911 to Manchester, England. Chandler (1964) gives a very detailed description of its early history. Ford differentiated itself from its competitors in 1908 through the unique manufacturing strategy implemented by its legendary founder, Henry Ford. Ford decided that economies of scale and a low cost product would be the key to competitive advantage. Therefore Ford built only one model, the model T, from 1908 onwards and attempted to do this in mass scale, low cost production. The reason Henry Ford chose the model T from his range of designs was that it was most suitable for mass production. The product was fully standardized. One of the innovations Ford introduced was the moving conveyor belt. Demand for the T-Ford grew rapidly, sparked by the low prices and economic growth in the United States. Ford expanded its number of assembly sites across the United States. In 1921 Ford's model T sold 845,000 units for a U.S. market share of 55%. Ford became a huge industrial corporation over the period, in part because it also integrated backward by acquiring coal mines, railways and steel mills. However, the model T's success in the end also proved to be its demise. Demand fell steeply after 1921 and in

particular during 1926 en 1927 due to the lesser economic situation and increasing substitution by second hand cars. Ironically the second hand market was flooded by Ford's own T model. Those consumers that bought new cars were no longer interested in the simple T-Ford model. With these lower volumes Ford was no longer able to maintain its low costs. This initiated a long rebuilding period for the Ford company, which saw its eternal rival General Motors evolve into the world's largest car manufacturer, which it would remain until the present day. GM's Alfred Sloan introduced a number of managerial innovations like the divisional M-form (Chandler, 1964) that provided GM with the ability to produce multiple models and to reconfigure its organization more effectively.

Setting the stage

In more recent history Ford initiated a new model, which was also seen to be a breakthrough model. Some observers, though not Ford itself, have likened it to the T-Ford. When Ford Motor Company in 1992 publicly launched its plans to produce a world car it was already its third attempt to do so. The idea behind a world car, sometimes also referred to as a global car, is that one design fits all. More in particular, the efforts by Ford have been aimed at building a car that can at least be mass-sold in both Europe and the United States, by far the largest markets for Ford. The very first attempt by the company to build one single platform that could be sold in different markets all over the globe without major modifications even dates back to 1960 (Kitchen, 1993). This was of course a time when the word globalization had not entered management vocabulary and most car producers were still mainly oriented towards their domestic markets. The project proved not very successful: some 60 days

before production was to be started, the U.S. version was cancelled. The reason was that although the car was innovative, being a front wheel drive economy car, it would also be more expensive to produce than existing larger models. A second try came in 1981 when Ford tried to sell the same Escort model all over the world (Kitchen, 1993). This time a much larger effort was undertaken to design a single model for both markets. Although the Escort in itself proved to be a marketing success, it had little to do with a world car in the end: only two minor parts were identical in the European and North American versions. These two parts were the water pump seal and the Ford oval badge, by the way. This time the main reason was that two distinct development teams had operated simultaneously on both sides of the Atlantic. Each group posed its own idiosyncratic demands. The Ford organization was still not ready at the time, so it seemed.

Under what circumstances did the Ford Mondeo come onto the market? Ford was still a fairly large firm, which was present in all key markets. Especially in Europe and North America, it had established a broad presence and attained a lot of market share. Ford even was European market leader in 1984, but slipped back into fifth place around 1992, just before the introduction of Mondeo. Table 2 gives some market share information for different markets in various years. More recently, after the introduction of the Mondeo, Ford has of course grown through acquisitions. In Europe, the purchase of Volvo in the late 1990s is the most obvious example. However, over the last two decades Ford also started to invest on a larger scale in Asia. It did so mainly through agreements with Mazda of Japan and Kia of South Korea. In April 1996 Ford even obtained effective control over Mazda. One problem related to both Mazda and Kia though, was that they were both relatively weak

players within their national systems. Kia came close to a bankruptcy in October 1997, after which the Korean government decided to nationalize the company. Mazda has been widely cited as a firm that lacks both scale and bargaining power to be an effective producer on its own. It stands only in fifth place in the ranking of automobile producers in Japan and came close to bankruptcy around 1980. Ford's key financial data are contained in table 3. They show that Ford Motor Company has grown substantially over the last 25 years, which is in large part due to the external acquisitions and the addition of rental (Hertz) and financial services.

Case description

After the 1960 and 1981 failures Ford started its third attempt to build a world car in 1986. Using the experience of what went wrong in 1981, European and American engineers started designing a new car, under the code name CDW27. Outside suppliers were involved in the project from 1989 onwards to develop specific components and modules of the car in a joint engineering effort. Three different brand names finally emerged, the *Ford Mondeo* for the European market and the *Ford Contour* and *Mercury Mystique* for the North American market. Of these cars, 90% of the elements were identical, although this is hard to see from the outside where the cars appear to be different.

However, certain differences remained. Seat belts and air bags had to be adapted to the local markets. Since U.S. drivers do not always wear seat belts, their cars were provided with larger air bags. European drivers had a smaller, 30-liter air bag. Ford admitted that it had to cope with different supplier processes, which made it tough to achieve the desired component commonality. Furthermore local conditions and mandates forced a number of changes. Most of the problems arose when Ford had

to re-engineer the Mondeo for the North American market and encountered U.S. federal standards and market conditions.

The stakes were high enough for Ford to make the success of this new car crucial. Some $ 6 billion were invested before it ever came into production, which is far more money than most competitors spend on a new model (the comparable Chrysler Neon cost only $ 1.3 billion to develop, for example). Because of the radically new concept, it is sometimes referred to as a 'new model T', the car that brought Ford its original fame in the 1920s. In Europe, sales of the Mondeo started in 1993, the United States followed some 14 months later. The car was sold in some 76 countries all over the world, although most sales are obviously realized in the United States and Europe.

Motives

Why did Ford decide to try its luck a third time, despite the fact that nobody else in the car industry was building a world car? The answer provided by the company was a reference to its high degree of internationalization, not just in terms of sales, but also in the spread of production sites and R&D knowledge. This led Ford to the conviction that it would be beneficial to consider a global approach instead of a multi-regional or multi-domestic approach. Mr. Philip Benton, Ford's President until December 1992, suggested that "A global company can concentrate its resources where they will be used most effectively".

So what advantages did this global structure provide the company with? *Economies of scale* were believed to be the first and most important reason behind the world car project. These economies were not only to be obtained in the production of the different brands, but also in their design and the sourcing of components and parts

from third parties. Being able to purchase double the quantities that a normal car model requires obviously gave Ford room for bargaining about prices. A second reason stems from the increased *flexibility* that Ford obtained. Both flexibility in purchasing and flexibility in production are thought to have grown. Ford can switch between locations (Europe and the U.S.) both for its own production as well as for sourcing components from suppliers. It would be easier to cover for delivery deficiencies on either side of the ocean too. Other reasons that were cited less often, include *achieving a global image* vis-à-vis customers, *creating new knowledge* through a worldwide network and a *reactive approach* to the loss of market share in some markets. This last point raises an interesting question: Did Ford decide to build a world car out of a position of weakness, or one of strength? Although Ford was still clearly the number two manufacturer of cars in the world (after its eternal rival General Motors), Toyota was starting to catch up, as were others. Furthermore, Ford had experienced some pretty bad losses, especially in 1991 when it lost almost $2.3 Billion. So the reactive strategy argument seems to have some ground as well, as Ford's position was gradually slipping. Ford felt that it needed to do something new that could again give it a competitive edge over key rivals. Since Ford still had plenty of financial and technical resources available when it embarked on the world car project, it could afford to invest in such a large project. And Ford had the advantages of a strong presence in both the North American and European markets. Ford was strong but getting weaker.

Internal organization

The Mondeo/Contour/Mystique was built on a project basis, where both the European and North American organizations contributed to the final product. From the earlier

adventures with the Escort model, Ford had learned that real integration would be important. When the Escort was designed, two different design teams from Europe and the U.S. were working on it simultaneously. As Mr. Benton put it "When there were opportunities to deviate from the shared engineering plan, both teams made the most of them, protecting their own turf and defending their own ideas about what constituted the 'right' product".

Ford's factories in Europe are concentrated mainly in Germany, the United Kingdom and Belgium. The Ford world car was assembled in three different plants, in Genk (Belgium), Kansas City (Missouri, United States) and Cuatitlan (Mexico). The European plant initially produced some 400,000 units annually and the two North American plants some 300,000 in all. So it may well be concluded that there was an even spread between the two continents.

Some key components in the car were sourced internally. At the beginning of the 1990s some 50% of components in the automobile industry were sourced internally, but this percentage decreased rapidly. One example of intra-firm sourcing for the world car was the transmission. The manual transmissions were produced in Halewood in the United Kingdom, and Cologne in Germany. The automatic transmissions came from a Ford plant in Batavia, Ohio. This points to a form of regional specialization in the sourcing network, since automatic transmissions are far more popular in the U.S. than in Europe with any new car model. Some 9% of the European Mondeo cars were equipped with automatic transmissions, a figure that was still 3% above Ford's expectations, by the way.

Role of outside suppliers

Outside suppliers fulfill a key role in the project, since some $ 2.5 billion were spent annually by Ford on components and parts for the world car. Important issues arise on the nature of the sourcing network. First of all Ford tried to integrate the European and North American supply bases as much as possible. Mr. Albert Caspers, Ford of Europe's chairman before the Ford 2000 program started in 1995, suggests: "The philosophy was to develop a part only once from one supplier in the world. This is the first project where we have done this". One of the key strategies was to reduce the total number of suppliers severely. The Tempo and Topaz models that preceded the American version of the world car had over 700 different suppliers. Ford was able to reduce this number to 227, using a worldwide supply office and early sourcing. The suppliers that participated were chosen through a global search. Ford itself used the term global-capable suppliers to illustrate its requirements. The suppliers were either chosen on their past performance or on a surrogate part. Mr. Dick Fite, who was the CDW27 supply director at the time, says: "The basic management challenge was to bring the two regional supply bases in North America and Europe together to find the best of all worlds in terms of technology, quality, cost, and logistic efficiency, so we could rationalize down to the fewest number of suppliers of best-of-class components on a worldwide scale". One way of achieving this reduction that Ford used was the tiering of suppliers. At Ford in Basildon (U.K.), Alan Draper, exterior purchasing agent, said (back in 1993): "We have used tiering in areas like instrument panels for several years and are looking to extend the concept to other areas". The suppliers were approached long in advance of actual production. Most of the contracts were upon for a longer period of time. Many suppliers committed themselves to the project

around 1989-1990. This allowed Ford enough time to discuss the car and its components extensively with the suppliers.

Just-In-Time is a central element of the production of the world car, although the intercontinental suppliers could, of course, not deliver JIT. For the other supplies, there was a great perseverance in pressing suppliers to set up plants in the proximity of Genk, in the case of the European Mondeo. Ford itself did not hold any stock of components and parts in the plant as part of the JIT system. This is why many new sites were established within 30 km of Genk, delivering within the hour. They included Kautexwerke (gas tanks) and Lin Pac Ekco (interior front door trim panels), who both started production in Belgium, in the towns of Tessenderlo and Overpelt. A second group started production a little further away, such as Ryobi Aluminium Casting. The Japanese parent of this company was asked by Ford to produce transmission and clutch cases for the Mondeo. A new and successful plant was established in Carrickfergus, County Antrim, Northern Ireland. In 1994 it was heralded as the 'best factory in Northern Ireland'. A third track followed, was by suppliers that were already located near Genk. Rehau, from Rehau in Germany entered into a co-operative agreement with Arrow Molded Plastics of Circleville, Ohio. Together they developed interior scuff plates, which Rehau then produced for the Genk factory and Arrow for North American production. Finally, some European producers moved to North America to establish joint ventures there, as well as Americans coming over to Europe.

The ever-present cost issue played an important role in the sourcing network of Ford. Economies of scale were an important reason to develop a world car. Ford estimated that through the higher volumes, it was able to reduce the cost of supplies by $150 a car. Since some 700,000 cars were made annually, this saved the company

up to $100 million a year. The following statement by Mr. Draper neatly illustrates the cost pressure that Ford puts on its suppliers: “we are asking our suppliers to absorb all future cost increases resulting from more expensive labor, materials, and overhead”. Thus these buyer-supplier relationships were not just co-operative, but contained elements of conflict too.

To what extent was this sourcing network international? It involved mainly suppliers that produce in North America and Europe, although some of these suppliers originated from Japan. Of the aforementioned $2.5 Billion, 140 Million involved exports from Europe to North America and 260 Million exports from North America to Europe. The North American share in the components of the European Mondeo was somewhere around 15%. This figure used to be in the range of 1-2% for older models, so this was a really remarkable change. This project also revealed some clear differences between supplier processes in Ford Europe and Ford North America. This created serious problems in the project: achieving maximum component commonality and quality were made much harder. On the other hand it also allowed Ford to gain insight in the peculiarities of the two parts of its organization. These two different practices provided the firm with a possibility for learning.

Information Technology

The Mondeo project posed two different kinds of demands on Ford’s information systems. First there was a need for IT to support or replace existing manual labor in the design and engineering area. This is simply a requirement in all modern production, particularly production of automobiles. Because of the increased complexity of cars, the ever-increasing technical demands and cost pressures all car makers have introduced IT in these processes. Second, Ford was looking at ways to

rapidly exchange data between different parts of the world and to support long-distance communication between its employees and with its suppliers. This was specific to the world car project because it put demands on international information exchange that were not there in a regular European or North American project.

The global scale of production allowed Ford to reduce the number of times certain operations had to be performed. Two prime examples of IT of the first kind of IT application mentioned above are structure calculations and design improvements. Ford invested in networked computers for problem-solving in the body structure design. To calculate the optimal body structure the finite element method is used nowadays. Basically the finite element method calculates what happens when pressure is put on small squares. Up to 70,000 small squares combine to form the body structure of the car. In order to make such calculations Ford had to use a large and powerful computer. Therefore it bought a new Cray 4MP super-computer during the Mondeo project, which was located at Ford's headquarters in Dearborn, Michigan. This computer served both the European and U.S. versions and ran for almost a year to complete all calculations. Obviously, this kind of application completely relies on computers like the Cray 4MP. The design of the car poses other problems. Fritz Mayhew, chief of North American design of Ford suggested: "An internationalism has taken over in designs and products, making it much more possible to do a global car". In order to do that, Ford's engineering people had to rely on standardized programs like Computer Aided Design and Computer Aided Manufacturing (CAD/CAM). In 1991 an international engineering team was installed in the Genk plant to prepare for the production launch of the Mondeo. This team exchanged data and pictures with other Ford engineering centers globally. CAD/CAM was the key tool used to reduce development times.

The second kind of IT application mentioned above does not deal with the technical capabilities of computers, but with the ability of IT to support communication processes over longer distances and to integrate geographically remote parts of the Ford organization and its suppliers. During the Mondeo project Ford installed real-time multi-site simultaneous engineering and information transfer as well as a global e-mail system. Many up front investments in facilities were made by Ford to allow for supplier involvement in product development, supply and manufacturing. This included telecommunications and computer equipment. From the earlier adventures with the Escort model, Ford had learned that real integration would be important. To achieve such integration Ford relied more heavily than in the past on information technology, like a complex video conferencing system. Prior to the launch of Mondeo production video conferencing was already used in communications between Ford's technical centers in Dunton, U.K. and Metternich, Germany. Later a transatlantic link was established. The video conferencing rooms Dunton are booked up to 16 hours a day. John Oldfield, head of the world car program said about the transatlantic video link: "Without video conferencing, the amount of travelling involved and the time differences would make a project like CDW27 near impossible". To make the global engineering project viable a worldwide communication infrastructure was needed particularly one that would allow for sufficient communication with external suppliers. However, not everything could be solved by long-distance communication. It was necessary for the project to physically move people. John Oldfield, the project leader, traveled back and forth across the ocean about once a month for six years. Throughout the project there were a minimum of 35 Americans working in the European organization, mostly engineers, purchasing people and finance people. At one point the engineering team consisted of

some 800 people. Ford flew hundreds of technicians back and forth across the ocean. Just before production started in Genk, Ford temporarily airlifted some 150 engineers from England and Germany to big, trailer-like mobile offices outside the Genk plant (at an estimated cost of $4 million to $6 million). Their goal was troubleshooting and solving production problems. However, Ford believed it was getting more for its money than the three new models. This includes an improved global communications network. Alex Trotman suggested in 1994 that: "But our investment is in much more than hardware. We've been learning a new way of doing business for the long term. I have envisaged Ford with a global organization since the late 1960s. It's a natural evolution. Now is the right time for such a change. The tools are there – computers and communications – and we have a strong balance sheet. If you make big changes when times are difficult, expediency often takes precedence."

Case analysis

1. What were the advantages of going global with its Mondeo for Ford and what barriers did it face to do so?

The advantages of going global were demonstrably there. Ford saved money by ordering larger supply quantities. Furthermore it could use the same internally produced parts, such as submissions, for the three cars on both sides of the Atlantic. The case also shows that Ford has struggled to find the balance between global integration and local activities. While the benefits of going global appeared obvious to the firm's managers, Ford was unable to avoid duplicating structures and adapting its cars to local demand. Local regulation was one reason for adapting the cars: North America and Europe obviously differ in some respects. Different consumer tastes also contributed to the adaptations. Europeans and North Americans sometimes tend to use

their cars in different ways. For example parking space is limited in most of the (older) European cities and streets can be rather narrow. North Americans often drive longer distances, thus preferring cruise control. Many Europeans prefer manual transmissions because it fits their driving style better than an automatic transmission. Thus some of the barriers to going global could not be overcome by Ford.

2. Was new IT the key enabler in establishing this global production and supply structure?

From the case description two arguments stand out. One is that Ford could not have made the transition required for the world car without new means of information technology and communication technology. Second, these new technologies helped to overcome some of Ford's problems, but failed to remove all of its concerns. It was still necessary to move around large numbers of people in order to deal with local production problems for example. Ford seems to have done a good job in integrating some of the technical functions involved in the project, particularly engineering and design. It is also obvious that most, if not all, of the sales efforts were localized. In fact, most consumers may not have noticed that they were buying a world car! As far as external suppliers are concerned, there is not much information on the use of IT. In historical perspective it seems that what occurred at Ford during the Mondeo project was a change of two kinds when compared with earlier experiences. First, there was information technology to allow for communication across borders, or perhaps we should say across oceans. Second, there was a conscious effort to have employees on both continents communicate with one another about the main design but also about all the details involved in getting the car produced.

3. Has the Mondeo become the new 'model T'?

Was the performance of the world car project good enough to call this car a new model T? Ford itself reported to be quite satisfied with the results of the world car project. Sales of the Mondeo model in Europe were quite good from the beginning, 470,000 units over the first 15 months, and it was also chosen as the European car of the year in 1994 right after it was launched. It must be admitted that the first remake of the model came rather quick though, in 1996. Table 5 provides the units sales of the Mondeo in Europe and its market share.

In the North American market the sales were reasonable too, although the model targeted a smaller segment from the beginning. In North America there were questions surrounding the high pricing, which caused some problems in marketing the product. Ford itself cited the learning effects, both internally and towards suppliers, as a very positive outcome. According to Mr. Parry-Jones, the vice-president who was in charge of the only Europe-based vehicle center in the new Ford 2000 structure: Ford "is now a lot more comfortable with the idea of working across the major regional borders between Ford and its supply bases and between the various organizational elements within Ford". This implies that Ford has increased its ability to conduct such global projects. As such, the company appeared to be quite satisfied with the outcomes of the projects. Although it may not have constructed a new model T, it did set out in a new strategic direction by becoming a more global firm.

External critics of the project have centered on two issues. The first is whether it is really possible to build a global car and use global suppliers. The problem is that while cost savings drive the need for a global car, there is a danger of the result being too compromised to appeal to any specific market. In other words, consumers in

different countries do want special features. Ford encountered this problem for example with the cup holder, that is a standard item in the U.S., but not so in Europe. As has been mentioned before, because of local tastes and regulations, the two versions only have 90% of the elements in common. Some industry watchers have also doubted whether consumers really want a global car. They suggested that an excellent car is what consumers want. Both the Honda Accord and Toyota Camry models have been sold across continents in roughly the same versions as well. But this was not because they had been made with the idea of a global car in mind, but rather because they were built to be excellent cars. These critics suggested that an excellent car can sell globally, but a global car cannot sell without some form of excellence. On a more basic level one can also wonder whether a car that is produced in only two regions is really global and whether sourcing almost 100% from the same two regions is really global sourcing.

The second issue of criticism concerned the development time of the car. The standard that was set by most Japanese producers is 2 to 3 years. It took Ford some 7 to 8 years to develop the car, and even 4 years after outside suppliers were first involved. The $150 savings per car that were reported earlier by sourcing in larger quantities, were more than offset by a $200 extra investment per car that Ford had to make in the car, following an improved standard that Nissan introduced in the European market in 1991 (including improvements in the suspension and the engine mounts). So the long development time cost Ford dearly.

The aftermath

Ford beyond the Mondeo introduction

After the introduction of the first world car, Ford decided to take the integration of regional organizations further. As part of the Ford 2000 program, it announced in 1994 that the European and North American car businesses would be merged into the division Ford Automotive Operations. The Asian and South American/Rest of World organizations were being left out for the time being. Since January 1, 1995, Ford was organized along product lines, in so-called vehicle program centers. Of these centers, four were based in the United States, whereas one was based in Europe. Each center was responsible for the worldwide design, operations and sales of a single product category. Ford was truly trying to introduce this method of global sourcing in all of its operations. A key statement of the Ford 2000 program was that Ford has 'a preference for suppliers with worldwide presence and resources to support global product development and manufacturing strategies'. The Ford 2000 program also included centralizing key managerial talent. Finally, it was unclear whether the organization along products in the program vehicle centers according to Ford 2000 would be beneficial. It was reported in the Financial Times in 1996 that many motor industry bosses said "Ford has failed to take account of the risks involved in convulsive change and will suffer as a result. Others, however, argue that hesitation today will only make the inevitable task of restructuring more difficult tomorrow". Four years later, in late 2000, reports emerged that the Ford 2000 vehicle program had resulted in a strong centralization of activities in North America. As a result, Ford was thought to have lost touch with its European consumer base, which caused a loss of market share. It was suggested (Muller, Welch, Green, Woellert and St. Pierre, 2000) that the Ford 2000 program led to an overly centralized organization and leaving Ford without leadership in Europe, South America and Asia. As a remedy the new Ford CEO, Jacques Nasser reinstalled executives for various regions in 1999. The strong point of

the whole Ford 2000 operation and Nasser's subsequent moves appears to be that development have come down dramatically, towards the level of Ford's main competitors.

The Internet

As far as using information technology is concerned Ford also took major steps in introducing new tools. The explosive growth of the Internet after the introduction of the Mondeo, triggered new opportunities to improve information exchange between Ford and its suppliers. Ford says that its top priorities are currently customer satisfaction and E-business. A much-publicized example is Covisint, a cooperation started by GM, Ford and DaimlerChrysler which aims to be a marketplace for the automobile industry. Much of the data infrastructure of Covisint and other initiatives is taken care of by ANX, the Auto Network Exchange. Ford participates in ANX since 1998. ANX is a private, virtual network that connects major carmakers in North America and over 280 of their suppliers. It is used amongst others for design drawings, secure routing of product specifications and EDI transmissions. The advantage of ANX is that it removes existing proprietary connections between buyers and suppliers and thereby improves interchangeability. ANX is much faster than existing communication lines, reducing turnover times by 50 to 75%. This can generate large cost savings, while maintaining or improving the security of data exchange. ANX is able to cope with a large variety of data sources. While exclusive Intranets or Extranets induce only more connections and a larger burden of work, an open Extranet like ANX decreases the number of electronic links. As the number of network members rises, so do the benefits of ANX. Ford's usage of ANX includes CAD / CAM applications, client server applications, interactive mainframe

applications and TCP/IP file transfer (for details see: http://www.anx.com/downloads/ford.pdf). ANX and its members have been pursuing expansion outside of North America. As Joe Boyd, telecommunications analyst of Ford in Dearborn said: "There's the issue of international suppliers needing to get access to applications on servers back here in North America, where we need the flexibility to support ones on other continents. An international ANX would be very desirable to us".

Conclusion

To what extent is Ford's experience in trying to achieve global integration by using information technology applicable for other firms and industries? It appears that all firms that internationalize their operations at one time or the other are confronted with conflicting demands. When McDonalds, the icon of global capitalism, internationalized its operations it soon found out that it was usually necessary to adapt its menu to local demand. Furthermore some countries had regulation that prohibited some of the practices the firm developed in the United States. The benefits of global integration are often taken for granted by internationalizing firms or industry observers. However, there is no such thing as a uniform process of globalization. One may suggest that only 10% of the European Ford Mondeo was different from the North American Ford Contour and Mercury Mystique. However, precisely this 10% raised the cost level of the car to $6 billion and delayed its introduction in North America (Smith, 1994). Even in the Internet age the location paradox sketched out at the beginning survives.

As for Ford itself it may well be concluded that the Mondeo / Mystique / Contour a turning point in its history. The world car has fundamentally altered Ford's

approach to building cars, which used to be two different approaches, depending on where the car was built. The world car induced an organizational change, in the Ford 2000 program, aimed at globalization. While it is not said that the outcomes of this program are positive, it is an important step in redefining the car industry. Mondeo may not be a new model T. Then again: will there ever again be a car that bears the significance for mankind that this one model did, with its 15 million units of sales? Perhaps we should forget about the capital T and simply refer to Mondeo as Ford's 'new model t'.

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Appendix

Pressures for global integration	**Pressures for local responsiveness**
Multinational customers are important	Customer needs differ
Multinational competitors are present	Distribution channels vary across countries
Investment intensity is high	Substitutes available and product must be adapted
Technology intensity is high	Local competitors important in market structure
There is a high need for cost reduction	Multiple host government demands
Universal market needs Access to raw materials and energy is limited	

Table 1: the advantages of global integration and local responsiveness (adapted from Prahalad & Doz, 1987: 18-21).

	1975	**1980**	**1985**	**1990**	**1995**	**1999**
Sales North America (thousands of units)	3,072	2,457	3,237	3,284	3,993	4,787
Sales rest of world (thousands of units)	1,618	1,969	2,397	2,588	2,613	2,433
Total sales (millions of US $)	24,009	37,086	52,774	97,650	110,496	162,558
Net income (millions of US $)	323	- 1,543	2,515	99	4,139	7,237
Total employees (numbers)	416,120	426,735	369,300	370,400	346,990	364,550
U.S. Employees (numbers)	203,691	189,917	172,200	180,900	185,960	173,064

Table 2: key data for Ford Motor Company, 1975-1999. Source: Ford Motor Company, annual reports 1975, 1980, 1985, 1990, 1995 and 1999. Please note that accounting changes may have occurred over this period. Later years include more revenues and income from services. A net loss is signified by - (1980 only). Ford is currently divided in two sectors: automotive and (financial) services. In services key brand names are Hertz and Kwikfit. In automotive Ford owns not only the Ford brand, but also Volvo. Mazda, Lincoln, Land Rover, Jaguar, Aston Martin and Mercury.

	U.S.	**Canada**	**Germany**	**U.K.**	**Europe**	**World**
1985	19.0%	17.0%	10.9%	26.6%	8.3	13.7%
1995	25.6%				11.9%	13.3%

Table 3: Ford market share between start of development of Mondeo and right after its launch. Source: Ford Motor Company, annual reports 1985, 1995. Please note that for 1985 Europe includes all European markets other than Germany and the United Kingdom. For 1995 its refers to Europe as a whole, including Germany and U.K.

Year	Event	Outcome
1960	First attempt to build a world car	American version is never produced
1981	Second attempt, Ford Escort	Two versions differ completely
1986	Third attempt is started	One U.S.-European engineering team
1989	Supplier involvement starts	Many components developed together
1993	Production and sales in Europe	
1994	Production and sales in U.S.	
1995	Ford 2000 program	European and U.S. operations integrated
1999	Ford 2000 program fails	Regional executives re-appointed

Table 4: short summary of events and their outcome

1993	1994	1995	1996	1997	1998	1999
317,765	380,083	353,769	323,727	331,003	317,843	231,943
10.1%	13.3%	13.0%	11.3%	10.8%	9.7%	7.4%

Table 5: number of units sold by the original Mondeo model and its European market share in the medium-sized car segment.