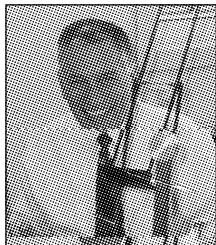


A flight into the future

DaimlerChrysler Aerospace



The future of air travel concerns aerospace companies all over the world, but it is also crucial to the interests of almost every other business. Franz Tessun introduces two highly conflicting scenarios developed by an interdisciplinary team at DaimlerChrysler Aerospace. Describing the practical experience of a passenger in the year 2020, the stories place particular emphasis on the interaction between economy, politics, technology, environment and society.

We advise Professor Samuel P. Langley not to endanger his excellent scientific reputation any further by continuing to waste time and money on experiments with flying machines. Life is short and he is able to serve mankind in much better ways than through what might result from attempts to fly. There are more useful occupations for the Langleys of this world! Editorial in *The New York Times*, 10 December 1903

Seven days later, on 17 December 1903, the Wright brothers' airplane made its first flight at Kitty Hawk. Some thoughts:

- Any decision with long-term implications is made with a picture of the future in mind
- Just imagine long range business decisions made with such a faulty perception of the future!
- How will your picture of the future compare with the actual reality in twenty years?

Aviation and space have become an integral part of our society. Without realising it, we make use of products, technologies and services from the aerospace sector every day. The technology developed by the aerospace industry is a basic element in the global economy, which is based on the division of labour. It has made people, goods and information mobile, and transformed the world into a global village.

Not only the intercontinental, but also the European and national streams of traffic would be inconceivable without the efficiency and flexibility of air traffic. Also, in terms of land

use and environmental compatibility, aviation is superior to other means of transport. For example, the fuel consumption of a modern airbus on a typical flight from Munich to Hamburg is less than four litres per 100 passenger kilometres.

The question now arises: How will air traffic develop in the next twenty years? Is the prediction of many air traffic market researchers correct, that air traffic will grow by approximately five per cent every year? Is it correct that airlines across world will order and pay for more than 16,000 new aircraft, worth approximately US\$1,000 billion? (Daimler-Benz Aerospace, 1996 World Market Forecast.)

The question of the future development of air traffic is pertinent for all aerospace companies. But it is also of interest to the ordinary citizen, because without air traffic he/she would no longer be able to reach many business and holiday destinations. Are the conventional market research and forecasting techniques sufficient to answer these questions about the future satisfactorily? I do not think they are.

We have tried to approach this question by using scenario techniques, which are described below. A few findings, which are also presented, show that, in connection with the forecasts made today, some interrelations have not been considered or taken into account. One example of such barriers in reasoning is a market forecast made by Mercedes Benz in the year 1900. At that time, market researchers predicted that there would never be more than one million cars in Germany because no more than this number of chauffeurs would ever be available. The

interesting thing here is the barrier in reasoning contained in this prediction. The market researchers of those days were unable to conceive of a future in which cars would no longer need drivers. We do not know what barriers and false reasoning we fall victim to today, but scenarios are theoretical models that may help us to overcome traditional ways of thinking and to better adapt to an uncertain future.

Point of departure

It is becoming more and more difficult to work out future strategies for air traffic since the dynamism of the political, economic, social and technological environment has increased dramatically, and is still increasing. In the aircraft industry, decisions need to be made about investments amounting to several billions of dollars, which will only be amortised in approximately twenty to twenty-five years. This requires intensive study of possible future directions of development in all fields surrounding the aerospace sector. Potential impacting factors on the business must be spotted early so that they can be consistently exploited in order that companies may develop an edge over the competition. Thus the creation of scenarios of the future, outlining conditions influencing worldwide air traffic, was a crucially important step in this direction.

Handling the mounting traffic is a top priority of the leading industrial nations of the world. Worldwide air traffic is currently characterised by growing numbers of passengers and increasing freight volume on the one hand, and by many loss-making airlines due to the price-wars on trans-

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Atlantic and trans-Pacific routes on the other hand. Many airlines have undergone profound rationalisation and restructuring.

The growing economic interrelations with the associated developments in air traffic require a more profound understanding of the interdependencies in the air traffic system.

In such a situation – that is, one in which decisions are to be made that will have effects reaching far into the future, with considerable uncertainty about the development of relevant factors in the surrounding fields – the scenario technique offers a pragmatic approach to reduce the uncertainties and to process them in such a methodical way that the proposed measures are understandable, plausible and target-oriented. It was, and is, our objective to acquire the orientation information about conceivable scenarios for air traffic in the year 2020 as a guiding framework to the conditions for products and services. The focus should be placed on the integral description of future global air traffic and the representation of major influencing factors. We certainly did not want to make any additional air traffic forecasts or primarily quantitative statements, but rather to acquire a more profound understanding of the interrelations in the air traffic system, and to ascertain the main factors influencing the system. As such, no finished product was created, but instead provided the basis for further work (for example, derivation of regional scenarios, early warning systems and so on) and the chance to incorporate this process in strategy considerations.

This scenario process was arranged as a seven-step, structured communication process, in which an interdisciplinary team of specialists took part, representing aircraft manufacturers, airport equipment providers, traffic and infrastructure planning, integrated traffic systems, research, and business development. Personal and time effort was substantial, involving seventeen experts, two moderators, and two students in a one-day 'kick-off' session, three two-day workshops, one day to conclude discussions, and one day for presentation preparation.

In the following sections, the two contrasting visions of are presented.



Flying is a pleasure

It is a sunny autumn morning in the year 2015.

K is still having breakfast in his apartment in Hamburg, browsing through his newspaper. Today, he can take a little more time because he is starting off on a business trip to Denver.

His wife takes him to the Hamburg railway station in her electric minicar. At the station, K heads towards one of the automatic check-in machines, which look like those used 20 years ago in the supermarkets to collect empty bottles. He places his suitcase onto the conveyor belt, confirming on the display that his luggage should be checked through to Denver. The check-in machine reads this information as well as the flight number K has booked from a re-loadable chip card, which has replaced the ticket and onto which K's secretary has entered the actual booking.

K gets on the TRANSRAPID train taking him to the Daimler-Benz Airport Berlin (the former intercontinental airport Berlin-Brandenburg). Thanks to the TRANSRAPID connection, the time needed to reach the airport is negligible.

The TRANSRAPID arrives at the Daimler-Benz Airport Berlin half-an-hour ahead of departure so that K can directly proceed to the boarding gate. The airport is spaciouly designed. An effective passenger and luggage transport and co-ordination system provides for smooth and continuous operation with short transfer times.

From his jacket, K fishes for his blue chipcard ticket. Before long he will have collected enough bonus miles to obtain the red frequent flier ticket.

An effective passenger and luggage transport and co-ordination system provides for smooth and continuous operation with short transfer times

When that happens his suitcase will receive door-to-door service. Twice a year he will be entitled to upgrade to the separate Flying Lounge Class aeroplane. These planes operate on highly frequented routes, parallel to the normal planes, but offer all passengers first class service.

When he reaches the service terminal, K again verifies his seat reservation with his chipcard. Realising that, meanwhile, one of the seats by the emergency exit is free, he changes the seat himself, because he prefers the greater legroom of this row.

The flight is called and the passengers press along the pier to the departure lounge.

A crowd of Japanese business men rush into the lounge with business documents in their hands and jackets over their arms. Presumably they were sitting in the Airport Congress Centre and had just realised what time it was when their flight was called.

K moves towards his seat, takes out the business documents for his trip to the USA and Asia from his briefcase and looks through them again in a more mechanical than concentrated manner. He stores the majority of information in his small laptop PC, which he opens and connects via cable to the modem receptacle. Via modem, he downloads to his laptop information received yesterday afternoon by his office computer in order to check if some late notes regarding his trip have been sent. K is to discuss organisational details with the company representatives in Denver and Pusan, as his company is about to move its headquarters from Europe to the economically more interesting markets of NAFTA and Asia.

He stows his computer, makes himself comfortable and, to kill time until his meal is delivered, begins playing a video game in his seat display. K still cannot get used to the automatic catering which rolls up and down the aisle, stopping at each seat. He finds this too impersonal and often dreams up some special request, so that a stewardess comes by in person.

After his meal, K again pulls out his ticket chipcard and puts it into a slot on the side of the video display on his seat. He has a second look at his route and finds out that his company has not paid more for the stage to Denver than he had paid for his private trips. Would it perhaps be possible to save money for his company by making use of one of the many other connecting flights between the USA and Korea? Directly from his seat and free of charge, K would be able to change reservations. Because of the many smaller Asiatic carriers serving the Pacific area, this investigation is far too much trouble for him and, tucking his chipcard away in his jacket, he selects the channel on which the flight details are transmitted directly from the cockpit.

One movie and several rounds of video games later, the flight arrives punctually at Denver Airport.

In the arrival hall, there is no need for K to find his bearings, and as a matter of routine he heads for one of the service terminals. With his ticket and credit card, and at a charge of \$10, he has his suitcase brought directly to the hotel so that he does not have to collect it from the belt (since there are no longer any customs checks between Europe and the USA).

The short meeting that K is to attend the very same day takes place on the other side of the city. K is just about to hurry in the direction of the local train when the loudspeaker sounds out: "We are sorry to announce that due to technical problems, the city transit line is out of service for 3 hours. Please contact our staff for information on ground transportation. Thank you." K knows that it is not advisable to take the bus or a taxi since the rush hour is setting in, turns round on the spot and, at the service terminal, for \$25 books a seat on the Airport Helicopter Shuttle Service. With a triumphant smile on his face he forces his way through the crowd of the other passengers still

standing around in a rather forlorn manner after their arrival from Berlin.

Flying is a nightmare

It is 6am. In the lobby of his hotel in Pusan, K is waiting for a taxi to pick him up. He has got a long flight from Korea to Europe ahead of him. He is bound for London, where he has to report to his company's headquarters before returning home to Hamburg in Germany.

As they have reduced the non-stop flights from Pusan to London to two per week, he has been stuck in the city for a day and a half after his conference has ended.

In fact, he could have left Pusan the day before yesterday, immediately after the last lecture, in which case he would have only got to Seoul on a Korean National Air flight, and then there would have been an almost 24-hour wait for their connecting flight. "I'd rather have the extra day here in Pusan and the non-stop flight with American Global Airlines," he thinks.

With the rush hour setting in, the taxi is twice held up in short traffic jams on its way across the city to the airport. K is starting to get restless because a glimpse at his watch tells him that he can now only hope and pray to reach the airport in time to comply with the two-hour deadline for his check-in and thus not lose his reserved seat. K's command of Korean is rather scanty and so he is not really surprised when he realises that the taxi driver has politely and smilingly dropped him at the wrong terminal. With a deep sigh of exasperation, K grabs the handle of his wheeled case and sets out on the long march to the American Global Airlines check-in.

In Pusan, the US carrier has only a single check-in desk and K joins the long queue of people already waiting there. "AGA announce a two-hour delay in the departure of flight 127 to London," resounds from one of the loudspeakers. Unfortunately, all passengers travelling in this region now have to face such problems as national protectionism in air traffic, which has reached a stage that, in the event of the airspace being busy, priority is automatically given to the national carrier. It may therefore be assumed that the AGA plane was put into hold for nearly an hour during its approach and

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was immediately given a departure slot for two hours later.

Two hours later, K has at long last left Korean airspace and has more or less settled into his tight economy class seat. As was to be expected, the plane is not fully booked, so K can stretch out and also use the seat next to him. "In the last few years the number of passengers has obviously not increased in the way the airlines expected when selecting the seating capacity of their planes," K thinks. No wonder, in the light of the worldwide recession, high ticket prices and the unattractiveness of flying, that airlines are chronically underused and that the financial returns are so poor. In the meantime, lunch is being served. "The lacking profitability of airlines is certainly not caused by the catering," K reflects, eyeing the meagre offering on his tray. "Let's hope they are not saving on maintenance like they are on the food. Who knows how long components in the aircraft will last, considering the give-away prices of aircraft these days!" The plane suddenly hits an air pocket, which hardly helps to dispel his doubts. And then the video display pops out of the backrest right into his chicken salad.

After an uncomfortable nap and a few hours of entertainment offered by the onboard video programme, K realises that flight 127 is approaching England. Despite another delay (which had been caused by air traffic control problems over the territory of the CIS), the plane at last touches down punctually, not taking the delayed departure into account. As darkness has already set in, K at once spots the illuminated lettering on the Glasgow Airport terminal. The plane has been diverted to Scotland, as London Heathrow has suffered a complete shutdown since the early morning due to smog.

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