Digital media's key role in the airline industry

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The real battle in the airline industry is not up in the sky, but on land, in a fight for brains and IT solutions.

So says Dr. Günter Kuchler, an executive board member of Lufthansa Systems, which provides high-tech systems for the aviation industry. He believes that what the pilots call interactive digital media (IDM) will play a key role in this clash of the fliers.

IDM refers to combinations of electronic text, graphics, moving images and sound, in a structured digital-computerised environment that allows people to interact with the data for appropriate purposes.

Dr. Kuchler outlines key areas of research and what they might mean for passengers:

INTEREST ON BOARD

Inside an airplane is the only area in our lives that remains an Internet-free zone, but passengers should soon be able to use their iPads and netbooks on board.

There are different technologies that allow connection to the Internet on a plane. Satellite is one of them, but this means small bandwidth, which makes connections slow and very expensive.

Ground-to-aircraft connections also work. This involves an antenna on the ground that can connect to 5,000 airplanes.

Because the distance by this method is much closer than with a satellite, it is easier to get big bandwidth, so you can bring on board not only Internet, but also content for entertainment systems.

That could result in live broadcasts of football matches, which could become a big source of revenue for airlines.

And if you have an Internet connection, you can use Skype, noiseless telephones and even text messaging.

BRING YOUR OWN SCREEN

Video screens for entertainment come in different sizes for different cabin classes. Weight is very expensive in the aviation industry, so the size of these things matters.

But things are looking up, so you will soon be able to bring your own devices on board, and new technology will probably allow content to be streamed onto it. But first, there will be issues to solve, including security, intellectual property rights of movies and piracy fears.

SUPER SYSTEMS

If airlines want to survive financially, they have to be very smart about how to sell and price tickets and manage their revenue.

These tasks require increasingly sophisticated computer systems that can help airlines find passengers who will pay the most for available seats.

It sounds straightforward, but these systems will have to be able to work a lot of things out.

Say there is a medical congress in a certain city. The system needs to take that into account and price tickets higher, because doctors can afford it.

It needs to be able to anticipate demand for tickets the day before the Grand Prix, because that's when the really big guns want to fly, and they don't care if it's $5,000 or $10,000.

If you sell only to people who buy three weeks earlier and pay much less, you will lose out in the long run.

The airline's system will also need to know what the competitors are doing, and needs to factor in things like destination optimisation. There are 300 million passengers flying a year, so if everyone has two requests, the airlines have millions of queries to answer.

This is mathematics, hundreds of thousands of differential equations that need to be solved in a millisecond. A highly complex system, a supercomputer, is required, one that will deliver optimal and accurate results.

So it's a brave new world — up there and down here.