



CRITICAL COMMUNICATION

Dietmar Gollnick *on the importance of staying in touch when it really matters*

Do you remember how it used to be? Very early, around 1850, the railway was invented. A new means of travel enabling 'word of mouth' communication between people in extended areas. A means of communication that requires extensive infrastructure. In the late Twenties, it was thought that this could be done more efficiently and without expensive infrastructure: simply travel by airship. But in May 1937 the devastating accident of the Zeppelin off Long Island, New York, reinforced

the need for multiple means of transport and communications.

At that time, globalised communication was already beginning and at that time the quick message was sent all over the world: railways are safer. And an indispensable part of a necessarily heterogeneous communication infrastructure. Also because of security.

Then there were the pagers. The pagers for 'you and me', for private individuals. In 1998 in the USA to pass on the mobile phone costs for the callback to the message recipient and, according to cute advertising videos from the USA and Japan, to arrange a disco with

a boyfriend or girlfriend in Germany. Today, people use SMS or WhatsApp or another app for this purpose. And millions of private individuals have not heard about the pager for a long time.

However, since shortly before 2000, millions of firefighters have been using pagers. Even today. Today even more than before. And IT technicians and on-call services in industry, services and healthcare. And this despite the fact that it was said again and again and in between: We have mobile phones, so why do I need an extra device?

Then there was the near simultaneous explosion of about 3,400 pagers in Lebanon. Suddenly, these devices were making headlines again. And the young news anchors had problems explaining what it was all about. That is, if they do not have a partner that work in the fire department. There are more than one-million firefighters in Germany alone. So, they and their families know about the need for dedicated alerting services.

No, alternative communication was not gone. No, just because the private person does not drive a fire brigade, it is still good to have such an organisation. For the protection of the private individual. So the events in September 2024 in the Middle East were also an occasion to inform about this once again.

It's about the infrastructure. The more independent infrastructures are from each other and the better they are interwoven for the end user at the user level, hybrid and, despite independence, the more secure they are. And the corresponding services, of course.

This is an outflow of probability theory. The probabilities of independent events can be easily multiplied by each other. With it the probability of default. So if the probability of System A failing is 2 percent and System B defaulting is 0.25 percent, then the probability of both defaulting at the same time is 0.005 percent. The (not only mathematical) resilience is 99.995 percent.

This is not the case if the events are dependent. In other words, if two mobile communications systems use the same core network or cross-connections between the radio sites or commercially available cellular systems with their distribution infrastructure are also used for police services. Then, of course, you can't simply multiply the probability of default with each other. The resulting probability of failure is ten or a hundred times higher than with independent systems.

So, security is much more likely if we use independent and diverse communication infrastructures. And security can also be produced and afforded. Maybe not for all the beautiful dreamed services, but with all the dreams we should not forget that warning, informing, alerting must first be started before broadband services and convenience are used.

If we don't take that into account, then there will be problems. This was the case with the summer 2021 flood disaster in a part of Europe that is surprisingly quite well populated and technologically advanced in the German Ahr Valley. In the end, however, more than 130 lives were lost. No one knows how many could have been saved if they had not relied solely on mobile phones and land-based police radio for communication. Cross pipes were washed away. People were not reachable. Maybe they would have been if they were still using a pager.

Many national and international organisations take care of broadband implementation in safety-critical areas. It makes sense to be able to query databases at the location of the exception event. To people and factual information. The colleagues are doing a good job there with standardisation and Plug-In tests to improve usability. But what if we have problems alerting the experts and emergency services? What if the population does not leave the endangered areas in time because they have not been warned in a communication-robust manner? The priority is clear: it has to work. And even if other infrastructure is not available precisely because of the state of emergency.

SERVICES INDEPENDENT OF PRIVATE MOBILE PHONE APPLICATIONS ARE VITALLY NEEDED

The Critical Messaging Association (CMA) has been an advocate of secure alternative communication for more than 25 years. Members from three continents: the USA, Europe and Australia. Operators, manufacturers, solution providers. State, private. Not so much a start-up as a continuous driver of innovation.

The organisation grew more strongly in 2024 than in previous years. The voice is heard even more. Certainly not enough, but that's what we're working on right now.

Earlier last year, we announced investment and mergers in Ireland and the UK. The pioneer of critical messaging as an operator and service provider joined forces with the high-profile provider of dedicated campus-based voice and data radio networks. Now both form a single source under one investor.

In May 2024, our member from South-Western France held its user day in Istanbul. The reason was obvious: The ministry responsible for fire protection in Turkey wants independent voice and data radio even when nothing works – for example because of forest fires. The corresponding network will be built up gradually. Part of it is in operation.

At the last conference in September 2024 in Amsterdam, we exchanged the experiences of the past four to five years very intensively. Covid and the war in eastern Ukraine (ie in the middle of Europe), the severe weather disasters in Florida and France, the forest fires and much more were the focus. And the conclusion is clear: In critical communication in general and in critical messaging in particular, the 'dying of beauty' is over. The solution must be functional. Vulnerability must be as low as possible. Existing things must be used instead of getting lost often and elaborately in the next priceless project. All of this has always been important, but it is even more so now.

Colleagues from the South-East of France and the USA, for example, reported on joint projects to connect sirens. Of course, this has to be done according to the 'MultiChannel' principle. Neither the American or Australian P25 nor the European Tetrapol or Tetra, neither cellular 4G nor 5G alone

The German fire service still uses pagers for communications in emergencies

are sufficient enough, especially if the alternative mobile infrastructure already exists in the region where the sirens are installed. Additional use, with little effort, make the probability of failure 50 to 100 times lower.

Our new UK member reported on the role of the control centre, our system integrator and developer from the Netherlands on integrated systems for traffic and safety, the nationwide network operators from the USA and Germany demonstrated the importance of having separate solutions ready.

WE CAN'T JUST RELY ON MOBILE PHONES AND LAND-BASED POLICE RADIO FOR OUR COMMS

In October last year, our long-standing member from Italy was able to report on a very large order from the Italian Ministry of the Interior: a nationwide dedicated independent voice and data radio network for the Italian Fire Brigade is now under construction.

In the working groups in Amsterdam and subsequently, a total of 12 essential principles for secure communication were worked out. To be found in full in source S1.

Alerting and warning is becoming increasingly important. And relying only on convenient mobile

phone services is technologically, legally and ultimately also economically impermissible. And yes, it is not important that it 'almost always' works with good comfort, but exactly when it matters.

Just as in armed conflicts in Eastern Europe, the last 100-million should not be spent on a beautiful aircraft, but on 50,000 drones and their defence, it is just as downright naïve to rely on MCX (Mission Critical Communication) for mobile communication solely on 5G or 6G infrastructure – in case of doubt and in the field and in the basement non-existent.

Devices, services and solutions that are independent of common private mobile phone applications are needed – and provided by CMA members and others. Fact.

Broadband is good. Availability is 100 times more important. Both at the same time – a challenge to economics, technology and scientific stochastics.

Backward compatibility is particularly necessary in an emergency, when you aren't able to build a new work or set up one of the popular research projects in the next hour.

Hybrid solutions of independent communication elements are state of the art.

No complete Mission Critical Concept without alternative communication. Yes, let's work on broadband and convenience, but let's not forget about hybrid solutions that include independent narrowband point to multipoint. The past has shown this and the last five years have shown this particularly impressively. And it is a standard ●

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Success is much more likely if we try to employ independent and diverse communication infrastructures

