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## Prague's fake ticket scam – what lessons can we learn?

Phil Taylor, 24-Nov-2017



Prague's transport system was hit this year by ticket fraud, with criminals introducing counterfeit tickets into the system in high quantities.

Prague City Transit (Dopravní Podnik Praha or DPP) – the company which operates the network – cannot say how long the fakes were being distributed, and any estimate of the financial impact would be sheer speculation. Only a few weeks before the exposé, a company spokeswoman claimed that there was no risk of counterfeiting tickets.

Once the scandal was exposed, DPP's contract with its ticket printing company was cancelled, and in the aftermath top management positions are reported to be at risk.

The quality of fakes was inferior, which shows how difficult it can be to prevent this type of activity in real-world settings. Tickets are protected with a hologram stripe and guilloches, and both were imitated but in a crude manner, according to Petr Hampl, a consultant from Czech hologram company Optaglio.

This now makes the investigation into the case even more difficult, because the attackers did not need any particular technology, he tells *Securing Industry*. The police investigation has not been closed yet, but chances of uncovering the perpetrators are considered to be small.

A new way of printing tickets is being discussed, and it seems that DPP is ready to spend vast resources on anti-counterfeit protection technology. "However, the core of the problem is somewhere else. It is connected to the process of inspection," says Hampl.

There are no turnstiles or gate checks in Prague, with random checks by inspectors on trams, buses, and the subway relied upon to catch fare dodgers. If the passenger does not have a right ticket, he/she must pay a fine. During the inspection, it is checked whether the ticket covers the area and whether the date is correct.



Optaglio's technical manager Libor Sustr. The tickets are sold in hundreds of places, so it is not difficult to distribute fakes. And because there is no archiving of used tickets, it is impossible to count the total number of fakes already used.

It's clear that the oversight process should be more robust, but Šustr notes that, in real life, it is difficult to define an inspection process that is enforceable and corresponds to skills of inspector. The low unit price of a ticket also contributes to the problem because passengers have no strong motivation to check the authenticity of their ticket, and successful counterfeiting can lead to significant losses for the transit company.

For strong protection implementing, several areas need to be covered consistently: tickets; the inspection process, staff training, support, and motivation.

Tickets must include a protection element that is distinctive and can be identified easily. This requirement means that most of the holograms applied today are useless.

"Visual effects such as a simple switching between company logo and some letters offer very limited protection because such hologram can be replaced by other holograms with same logo and letters," warns Hampl. "Not long ago, colleagues from Optaglio examined a fake in which the original hologram with an eagle was replaced by a hologram depicting a flower. Many guards still did not notice that there was something wrong."

A great protective hologram needs to include something very distinctive, shining and attractive, such as 3D animation, changing bright colours, new illusion objects emerging from a background, etc. It is helpful if something palpable such as figure, animal, flower, etc. can be found in the hologram, says Hampl.

Any effect used in the hologram must be highly resistant to imitation, and leading hologram manufacturers offer unique features that cannot be imitated by anybody else, such as moves of illusion objects in unexpected directions, sharp changes in colours, emerging QR codes, etc.

He recommends that tickets add further levels of protection to enable inspectors to go more in-depth in case of any suspicion of authenticity. That could involve examining the hologram under red light or using a magnifier to detect covert features.

Another approach – Optaglio's specialty - is to use microholograms, tiny particles that look like metallic dust. Looking at them through a magnifier reveals regular shapes and engraved letters or even engraved pictures, while more detailed viewing under a microscope reveals the full hologram with all effects on each particle.

In addition to manufacturing counterfeit-proof tickets, it is essential to motivate inspectors, and successfully identifying a fake "should be something like a lottery win," says Hampl. In the real world, it is unlikely that each ticket is examined in detail, but frequent checks are essential for deterring counterfeiters and for fast identification of fakes. Paying inspectors well, and providing regular training with an emphasis on distinguishing fake from genuine tickets, is crucial.

An often-asked question is: should be information about protection elements made public? It may protect people and get them involved in anti-counterfeiting efforts, but it also helps attackers, says Hampl.

Central banks often publish all details about protecting elements on banknotes. The critical reason is to help people to avoid losses caused by accepting forged money, he points out. For tickets with low unit price, publishing details makes sense only together with creating some form of motivation for fakes identification.

Providing some form of reward or bounty to inspectors or members of the public who spot fakes for example free travel or a financial bonus - is another potential strategy and could be a strong tool for deterring counterfeiters, but some security features should remain undisclosed for investigative purposes.

"Regular innovation also shouldn't be underestimated. Counterfeiters are learning fast," says Hampl. "It is unlikely that they will be able to imitate holograms or other protection elements [but] they can produce something quite similar and fool inspectors."

It is therefore essential to organise regular review considering technological changes such as transitioning to holograms with higher resolution.

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