

E-Payment and DRM for Digital Content

Report on the 2nd INDICARE Workshop
held on
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by

Ernő Jeges, SEARCH Laboratory

Kristóf Kerényi (ed.), SEARCH Laboratory

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<http://www.indicare.org>



The Informed Dialogue about Consumer Acceptability of DRM Solutions in Europe

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You are invited to send any comments, criticisms or ideas you may have on this publication to:

Kristóf Kerényi (Editor)
SEARCH Laboratory, Budapest University of Technology and Economics (BUTE)
Phone/Fax: +36 1 205 3098
E-Mail: kerenyi@mit.bme.hu

INDICARE Project

INDICARE – The Informed Dialogue about Consumer Acceptability of Digital Rights Management Solutions – addresses problems identified in the *eContent work programme 2003-2004*: “There has been little attention to the consumer side of managing rights. Questions remain open as to the level of consumer acceptability of rights management solutions. Interface and functionality of systems, as well as policy issues linked to privacy and access to information should be investigated. The consumer question also involves the easiness of access, the legitimate use of content and business models and the easiness of access for disabled persons” (p. 19). In addition to consumer issues, INDICARE addresses the user side, in particular the concerns of creators and small and medium-sized information providers.

INDICARE maintains an informed dialogue about consumer and user issues of DRM. *Informed dialogue* means that discussions are stimulated and informed by high quality input, such as news information and profound analyses. Options for participation and more information are provided at the project website:

<http://www.indicare.org>

INDICARE produces the monthly journal “INDICARE Monitor”. To subscribe to the e-mail notification about contents of new issues and other project news, please type in your email address at the INDICARE website or send an empty e-mail to:

indicare-news-subscribe@indicare.org

The INDICARE project is managed by the following partners:

- Forschungszentrum Karlsruhe, Institute for Technology Assessment and Systems Analysis (FZK-ITAS), Project Co-ordination
- Berlecon Research GmbH, Berlin
- Institute for Information Law (IViR), University of Amsterdam
- Budapest University of Economics and Technology, SEARCH Laboratory

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1 Introduction

INDICARE is a European Union funded research project aimed at creating an informed dialogue on consumer acceptance of Digital Rights Management (DRM) Solutions in Europe. The overall goal of INDICARE is to raise awareness, to help reconcile the diverse interests of multiple players, and to support the emergence of a common European position with regard to the consumer and user issues of DRM solutions.

Besides maintaining an electronic discussion forum on the project web site and providing input to it with articles and a web log, the project's instruments include a consumer survey, five thematic workshops, state-of-the-art reports, policy papers as well as user and consumer guides.

1.1 INDICARE Workshop Series

The five workshops within the project each focus on different sub-topics related to DRM: Business Models for Mobile Music and DRM; E-Payment and DRM for Digital Content; DRM in Science, Education and Libraries; Human Factors of DRMs. A report on the first INDICARE workshop "Business Models for Mobile Music and DRM" is already available at the INDICARE web-site (<http://www.indicare.org/events>)

The aim of the workshops is to stimulate discussion between different parties in DRM-related business, from consumers to content providers and vendors.

1.2 Second Workshop: E-Payment and DRM for Digital Content

The second of the five INDICARE workshops was held at 3 February, 2005 and organised by project partner SEARCH Laboratory. The event took place in Budapest, in the Informatics building of the Budapest University of Technology and Economics.

Around fifty participants from all over Europe attended the workshop. This event brought together experts from the area of Digital Rights Management related to electronic payment solutions: researchers, developers and users of e-payment from academia, business and industry.

The conference had an interdisciplinary approach, with a focus on technical solutions, business models and market developments. Special attention was paid to consumer issues, in particular the level of consumer acceptance of new DRM and electronic payment systems.

Slides of the presentations are available at the INDICARE website (<http://www.indicare.org/events>).

1.3 Workshop Topic

The main topic of the workshop was the relationship between e-payment and DRM. As more and more people have broadband access to the Internet and e-commerce is taking off, electronic payment is gaining momentum

with every day. Digital content is being sold in increasing amounts, and digital distribution needs electronic payment methods. Therefore the role of e-payment is of high importance, since consumers prefer integrated solutions when purchasing and using digital content.

The key speakers covered the latest trends and the state of the art in local and remote e-payment methods, their integration with DRM solutions, and consumer issues, especially the question of consumer-friendliness. Each section was followed by a lively debate, in which participants were encouraged to ask questions and to discuss their views with the panellists. The topics discussed included:

- Electronic and mobile payment solutions
- Service providers' views on e-payment
- Digital rights management solutions
- Case studies of business models
- Security analysis of business models
- Legal issues
- Standardisation issues
- Consumer acceptance and consumer concerns

2 Workshop Programme

2.1 Introduction: Interaction of e-Payment and DRM Solutions

The workshop was organised around four thematic blocks, with two or three invited speakers for each block, each with different views or perspectives of the topic. Each block was followed by a forum in which the panel, consisting of the speakers in that block, answered questions from the audience.

The workshop was opened by *Kristóf Kerényi*, research engineer at SEARCH Laboratory. He welcomed participants to the event, and introduced the INDICARE project to those not yet familiar with it. He explained the aim and topic of the workshop and outlined the main structure of the event.

Kerényi, in his keynote presentation, suggested that, while e-payment may seem no more than a technical question, it is indeed closely related to DRM. The first reason for this is DRM's original aim as a means of remuneration. Secondly, since consumers prefer easy-to-use systems, the only solutions capable of widespread acceptance are *integrated* ones, in which *DRM and payment* are part of the same "consumer-centric" business model.



2.2 E-Payment Technology

The first block of presentations was ordered around the technological questions of e-payment. Traditional e-payment solutions have been in use on the Internet for years, so there is not much current development in that area. However, with the expansion of the mobile market, and with hand-held devices making it into our pockets, a transition to m-payment is taking place. This will be even truer as mobile devices open up new opportunities like near-field communication and the use of smart-card-based security.

2.2.1 Mobile Payments

Risto Sipilä, from the Corporate Strategy Unit of Nokia started his presentation by introducing new use cases which are made possible by technological advances on the handheld market. He mentioned smartphones as examples, which are capable of music playback, real-time video sharing, corporate e-mail connectivity and, of course, m-commerce. Sipilä said that a group of new *touch-based* services based on near-field communication was emerging: the so-called *Radio Frequency Identification (RFID)* technology. He described this new technology as having the potential to open up new possibilities in proximity payment and ticketing. As opposed to remote payments, near field communication is based on locality, where new types of point of sale (POS) terminals will accept e-cash or tickets (e.g. cinema tickets) directly from the consumer's mobile phone without having to connect to the mobile network.

Sipilä underlined two very important aspects when developing new mobile services: on the one hand ease of use was very important, from easy-to-use terminal (phone) user interfaces through easy service discovery to convenient payment methods. On the other hand, besides *user friendliness* he urged for *open technologies* and *open standards*, in which Nokia was playing a key role by developing solutions in strong industry cooperation and throwing its weight behind standardisation efforts.

2.2.2 SEMOPS – At Any Price, By All Means

Péter Papolczy, technical manager from Fornax, gave an introduction to SEMOPS (Secure Mobile Payment Service) a research project funded under the 6th Framework Programme for Information Society Technologies of the European Union. As he explained, SEMOPS was neither yet another micropayment or mobile payment solution, nor another mobile bank. Instead, it was a new concept of *real-time payment service*, which could be implemented across a variety of mobile devices or other handsets, over different data carriers (from near-field communication to mobile networks), and for a large spectrum of payment amounts.

SEMOPS is differentiated from other e-payment services by its consumer-centric design. It not only provides consumers with unprecedented *flexibility* in use of many devices, such as PCs, PDAs, or Java phones, and in use of different modes of transaction data transfer (e.g. SMS, text file, http-

messages, or offline). It also attempts to ensure the *privacy* of its users. This is a quite new approach to e-payment, since so far in every widespread solution the consumer has been traceable. SEMOPS, however, combines consumer anonymity with refundability, which will probably distinguish this new service from the other existing solutions. Finally, Papolczy drew the audience's attention to a short video clip, "My Mobile Day", which introduced an incredibly new world of payment through the new SEMOPS solution.

2.2.3 The Mobile Provider's Role in M-Commerce

Pál Miletics, product manager from Pannon GSM, Hungary's second largest mobile service provider, talked figures about the mobile telephony market and the mobile market in general. In his view, customers demand services from information access, content download, ticket purchase, parking payment, or ordering. Appropriate payment solutions include micro-payments and subscriptions. He underlined that there was a big difference between traditional e-commerce and m-commerce, the latter providing anytime-anywhere type services limited only by the handset's capabilities. He also said that *limiting technical factors* – like small displays and restricted input techniques – would always put it at a disadvantage compared to computer-based services.

Finally, Miletics showed an example of road-tax payment with a mobile phone, and he also mentioned a pilot project for m-government services being introduced by Pannon GSM.

2.2.4 Panel Discussion

Besides asking for clarification and technical details on the services introduced by all three speakers, the audience raised two important issues. The first question was whether technological advances drive new business models, or if it is the other way round. Sipilä, coming from a company at the forefront of technology development, said that new inventions could enhance traditional methods of communication and payment, and thus *new technologies would foster new business models*. He went as far as saying that new technology has the potential to create *new types of consumers*. Papolczy, on the other hand, said that development did not come from technical ideas, but rather the existing market demand for new applications presented a need for technological development.

Another question was about whether consumers really wanted to use newer and newer services. Miletics said that consumers usually did not understand the benefit of new technologies, so accurate surveying of market needs would be very important. He also pointed out that while m-commerce solutions were quite expensive both for consumers and operators, prices had to be kept low in order to be able to introduce new services. He said that due to competition between providers – and consequently ever-decreasing monthly fees – consumers tend to get used to cheap services, which makes the introduction of new technologies very hard. Therefore, he said, when

and how to introduce new technologies was more a question of business policy.

Sipilä also mentioned the large variation of consumer acceptance on international markets. For instance, in the United States there was nearly no acceptance of mobile applications, but acceptance is now changing quite fast. The situation of acceptance in one country is hard to scale, exemplified by the “i-mode” case.



2.3 Service Providers on DRM

In the second block of presentations two speakers presented their views on the provider side of e-payment and DRM. The first of the two referred back to the previous presentation, describing the *technical background* of Pannon GSM's m-commerce solution. In the second presentation the attendees heard a selection of case studies from the technology provider's point of view.

2.3.1 Cellum's Secure E-Payment Solutions in a Mobile Environment

Balázs Dobos, CEO of Cellum – a cutting-edge mobile commerce solution provider – gave an introduction to the technical details of Cellum's e-payment solution. Cellum develops consumer products optimised for mobile infrastructure, covering the entire range of mobile applications, from mobile ticketing to mobile recharge and multi-vendor loyalty schemes.

What makes Cellum technology unique, Dobos said, is the combination of full mobility with banking-level security: Cellum turns the mobile handset into a trusted client-side agent. He emphasised that the key to their success is that they make a win-win scenario possible, in which consumers, mobile service providers and vendors can all equally benefit from new services.

2.3.2 Money Out of Thin Air

Tamás Foltányi, IGS manager from IBM Global Services, gave a presentation on mobile business models. Having had ten years' experience in the banking sector and currently working for a technology provider, Foltányi knows both sides of the business environment.

He pointed out that this environment is *significantly different* in the United States, in the EU and in Eastern Europe, so care must be taken when one wants to talk about *business opportunities* in general. He said that consumer interest in e-payment services is present, as is the technical background, so using e-payment is not a problem. However, when analysing opportunities, one must look at the whole “value chain”. Foltányi said that there are three types of operators: wireless operators, solution providers and financial services providers. The question is: *who will “own” the customer?* To support his view he described three scenarios and five case studies, through which the audience could see that there are completely different models for how payment collection can occur. Mobile payment can be done (1) at online purchase of intangible goods, (2) as “passing by” payment with RFID on specific devices (e.g. E-ZPass for highway payments), (3) at unattended POS mainly with micro-payments (e.g. Speedpass with RFID in car keys), (4) at attended POS (e.g. McDonalds) and (5) at online purchases even of tangible goods due to the ease of use of mobile phones (e.g. Mobipay).

Foltányi concluded that the consumer is in a very easy position, as he got newer and newer opportunities. Operators, however, have to think over when to come to market with new solutions, since they could only be profitable when risks of introduction and investments are low.

2.3.3 Panel Discussion

The main question in the second panel round was that of security and trust, including topics such as identity theft, implicit and explicit actions, and the risk for consumers to lose money while using e-payment systems.

Kristóf Kerényi said that it is not enough for a payment service to be secure, but it is also important, perhaps even more important, that consumers are made *aware of the security* of payment services. He said that in his view a lack of trust from consumers is a major issue: “belief is more important in this case than the real security level”.

However, Dobos said that he did not think that it was the technology provider's role to educate consumers on the security of an electronic payment system. He also said that there is a trade-off between usability and security. Foltányi threw new light upon the question when he said that security is *not a real issue for consumers*, because banks are always responsible for paying the costs arising from fraud. He said that it is the technology provider's task to keep the system secure, and since consumers have already become used to this, they will always trust new solutions as long as they do not have to bear the financial consequences of security breaches.



2.4 Content Providers in Motion

The lunch break was followed by the third block of presentations, this time with DRM in focus. In the first presentation the speaker gave a quite interesting view of the meaning of DRM, which divided the audience and later led to a lively debate about what DRM really is and is not. The second speaker presented and analysed an interesting new approach to the involvement of consumers in the distribution chain, and through this the creation of more functional and acceptable DRM systems.

2.4.1 Why Use DRM?

Tibor Sas, secretary general of the Database Copyright Association, tried to answer to the question of why DRM should be used, and what the problems are for which DRM could be the answer. First, he looked at DRM from the infrastructure point of view and regarded DRM as infrastructure for the management of rights. He concluded that also for the DRM infrastructure a critical mass of consumers would be necessary to pay off. Comparing DRM licences with tickets on public transport, he said that just as when someone pays for a ticket, that person does not buy the tram, so is it with music: we just obtain licences to listen to tracks and do not buy any property.

Second, Sas emphasised the *importance of object identification*, and proposed the widely used Digital Object Identifier (DOI) as a means of solving several DRM-related problems, especially the collection and distribution of fees as a main purpose of the DRM infrastructure. He also brought up several use cases with existing problems e.g. in component reuse, print-on-demand of small-volume publishing, and mixed-financed learning mate-

rials. He came to the conclusion that object identification and DRM could solve these, especially by identifying, tracking and billing uses of the many small-scale components by many parties.

Finally, Sas pointed out that in his view the chief problem was the lack of e-content materials in the appropriate quantity and quality. He concluded that a working DRM infrastructure and intensive content protection would encourage providers to supply more valuable content.

2.4.2 A Security Analysis of Business Models for Digital Products

Professor Dr. Rüdiger Grimm, Head of Department at the Institute of Media and Communication Science at the Technical University of Ilmenau, Germany, talked about a conflicting situation between content providers and their consumers about the same source of a digital product, available on the network. He examined several alternative business models, among them Light Weight DRM system and the PotatoSystem of Fraunhofer Institutes, as well as Music2Share by a consortium of universities in the Netherlands. The particular feature of PotatoSystem, which was developed by Grimm and Nützel, is to allow reselling by customers and thus provides incentives not only to legally buy digital products but also to contribute to the distribution. The system would be especially attractive for new artists.

Professor Grimm also talked about digital payment methods having to be integrated into the purchase procedure. He pointed out that payment is not integrated in most of the existing DRM systems, and that this is a mistake. LWDRM and the PotatoSystem, in contrast, have payment integrated in the purchase procedure, he said. Finally, Professor Grimm called for a harmonised solution, technically standardised and widely accepted on the market.

His conclusions were that a great number of consumers are ready to pay for fair use, and providers are ready to deliver content for payment, so a *mutually acceptable level* of payment is the key. Therefore, he said, *payment has to be integrated with DRM* and free usage has to be enabled after payments are required.

2.4.3 Panel Discussion

The discussion started with a deep controversy: attendees with a strong legal background objected to the analogy between DRM licences and public transport tickets. This question created very lively discussion, but the participants could not come to a common conclusion. Sas explained the reason for his comparison was that in each case, an infrastructure for the collection of exchange value first has to be created. When someone wants to travel on the tram, for example, they know how to pay and to whom. On the other hand, if someone wants to use a picture found on the Internet, it would be difficult to find out whom to pay. This shows the importance of DRM for rights management in the business-to-business area.

Professor Grimm was asked whether he thinks that there is an optimal, or rather, a *tolerable rate of private use*. He answered that in some cases, as with non-digital content, five-to-ten private users are normal. For example,

when someone buys a book and also lets his family and some friends read it. He said the level depends on the product.

People often bring up the argument that digital goods cannot be compared to physical goods, since they have no production costs, and therefore the loss of profit does not show in the same way as when, say, a book is stolen from a bookshop. Professor Grimm explained that there is a huge difference between *production* costs and *reproduction* costs. The production costs have not changed in the digital era; it is just the reproduction costs that are close to nothing. But in any case, the provider has to *cover production costs through revenues collected for reproduction*.

2.5 Business Models for Consumer Satisfaction

The last session of the day was about the business and legal issues of DRM, and exchange-value collection. In the first presentation the attendees heard an economic analysis of business models, examining the impact of several factors on pricing. The second speaker talked about collecting societies and their possible role in a world of DRMs. Several standardisation issues were also mentioned here, which – complementing DRM systems – could lead to the maintenance of levies and the fairer distribution of money collected from content users.

2.5.1 Techno-Legal Content Protection and Structural Substitutes

Vural Ünlü, from the Munich School of Management, presented the result of a scientifically well grounded analysis of DRM business models. First, he introduced his thoughts on the digital dilemma: companies understand the importance of digital content, but are afraid of piracy.



Second, he categorised content protection strategies into three groups: in the past, content providers used physical and legal (copyright) protection for their content. In the future, however, technical protection measures combined with contractual and statutory protection could form *techno-legal protection*, and the alignment of business models could mean *structural protection* for content. This latter would hopefully reduce the need for techno-legal protection, he said. In his opinion, billing is a part of the logical DRM architecture, and in the future we can expect more metered use billing for content (more similar like gas and electricity billing).

Ünlü then analysed the optimal level of technical content protection. His conclusion was that *valuation* and *content degradation* are major determinants of this optimal level, which also rises with the *network effect*. For instance, degradation is the difference between original copies with additional services and pirated copies that may contain spoofs. However, the “*myth of profitable piracy cannot be confirmed*”. Two further findings were that the profits of content providers are reduced when protective measures cause *utility decline* for consumers, and that the alignment of business models may result in an additional positive revenue impact.

2.5.2 The Digitisation of Collective Rights Management

Dr. Péter Benjamin Tóth, lawyer at Artisjus (the Hungarian Bureau for the Protection of Authors' Rights), gave a presentation on the role of collecting societies in a world of DRMs. Initially, in order to put an end to common misconceptions about collecting societies, he defined *collective rights management* as a *joint exercise of copyright in order to collectively licence uses and collect and distribute royalties*. Then Tóth suggested that DRM systems as we now know them are not real rights management systems: instead he suggested naming them *Digital Content Control* systems.

The main issue of the presentation was whether with the sweep of DRM systems collecting societies will die out, or whether collective rights management still has some future. He asked if DRM and levies can coexist, and if it makes sense to collaborate with DRMs to make royalty distribution more accurate. He pointed to an example of a collecting society in The Netherlands that would already use DRM for fulfilling its tasks.

The answer, he said, might be given by the International Confederation of Societies of Composers and Authors. CISAC's aim is to develop documentation and distribution standards for the sake of better accounting between collecting societies. CISAC works together with ISO, and they have actually developed accepted standards for the identification of works and rights holders. This forms also the basis of every DRM system, Tóth said. After describing a wide spectrum of further standards, he introduced the MI3P (Music Industry Integrated Identifiers Project). MI3P's aim is to *automate information exchange* between record producers, music collecting societies and their business partners, so it will not replace existing systems, but will instead increase their value by creating connections.

2.5.3 Panel Discussion

The last discussion round of the day, besides some clarifications on the last presentation, focused mainly on maximising the value of intellectual property. Ünlü talked about content degradation as a means of increasing the difference between the original and a pirated copy. This, he said, is a kind of substitute for strong protection methods. If the original version is more highly valued then piracy will spread more slowly. However, Ünlü pointed out that, while it lowers the optimal level of content protection, content degradation measures are prohibitively expensive.



A participant asked whether a provider can distribute content with lower strength protection more efficiently or cheaply. Ünlü said that special devices are needed to implement more secure DRM techniques and a direct relation exists between the protection level and the cost of these devices.

Another participant pointed out that the upsurge in DRM systems is inevitable. She asked the speakers whether they think DRM systems will be successful because they will be more acceptable to consumers, or because they will be so strong that it will be impossible to circumvent them. Tóth answered that the latter will be the case: the supporters of DRM will dictate terms very aggressively without paying much heed to consumer interests. However, he also pointed out that the education of consumers could be beneficial: in the last two years, since the beginning of the anti-piracy campaigns, two thirds of file sharers have ceased their illegal peer-to-peer activity, he said.

3 Conclusions

3.1 Conclusion: The Need for Integrated DRM and Payment Solutions

Zoltán Hornák, INDICARE partner from the Budapest University of Technology and Economics, summarised his conclusions on the whole day activities in his closing speech. He said that consumers see DRM and payment as one system. They do not want to know about special banks, device vendors, service providers or technical details, they want to obtain content with just one click, and therefore integration of these two services is a must.



E-payment was represented at the workshop mainly by mobile payment, because although there are limiting technological factors (small display size, smaller storage space), the evolution of connected mobile devices is faster than in wired environments. Today's handhelds have several different ways to connect their environment wirelessly, among them the above-mentioned RFID technology. Moreover, mobile devices can provide a richer experience, while their usage is still quite easy. The future of mobile DRM will be bright when ease of use can be combined with easy service discovery and convenient payment solutions. However, the integration of several approaches in this field (security, privacy, easy deployment) is also needed.

One of the main problems, Hornák said, was that it is still unclear what consumers need: surveys seem to be unreliable, because consumers themselves do not yet know what they want. Therefore the “killer application” has not yet come to light. Several business models were presented at the workshop, and one could easily see how complex they can be: so many factors determine success that it is very hard to find the optimal balance.

DRM can also be considered an infrastructure, which still does not exist in the form that, for example, public transport infrastructures do. The question is: who should establish, maintain and pay the costs of this infrastructure?

Fair use was also one of the main topics of the workshop. A key assumption was that consumers are willing to pay for fair use, so content providers should turn this to their advantage. This is exactly what PotatoSystem does: it brings consumers and providers together. Users, who can redistribute content, are motivated to pay for valuable goods since they can earn money through reselling. In this case, no copy protection mechanisms are needed any more.

Finally, Hornák summarised the legal issues which were aired at the workshop. There is an ongoing debate around the globe about intellectual property rights and whether DRM is really about managing rights. We learnt that collecting societies may have an important role in the future of rights management and that levies are not necessarily bad. They could complement DRM and could be supported by DRM-like identification systems.

Hornák's summing up of the day was that payment for digital content is one of the key challenges for today's IT business, and without integration with DRM systems, business models cannot succeed. But even more important, he said, is that providers should pay more attention to consumer wishes, to create a more acceptable system for digital content distribution.

3.2 Summary

The second INDICARE workshop, organised by the Budapest University of Technology and Economics, was a success in bringing together researchers and industry representatives from across Europe to learn more about the future of DRM and e-payment solutions and to discuss their views in this field.

Four blocks of presentations were held, each one followed by fruitful discussions in which the audience could ask further questions and elicit opinions from the panel of speakers in that block. Several interesting issues were raised, and consumer issues were also brought up in several cases. The slides of the presentations are available at the INDICARE website (<http://www.indicare.org/events>).

The event was also very successful in promoting the INDICARE project to international DRM players and stakeholders. The whole INDICARE team looks forward to the third workshop to be held on 28 May 2005 in Amsterdam with *Fair use* in focus.

List of Speakers

- Dobos, Balázs
Chief Executive Officer, Cellum BV
<http://www.cellum.com/>
- Foltányi, Tamás
IGS Manager, IBM Global Services
<http://www.ibm.com/services/uk/>
- Grimm, Rüdiger
Technical University Ilmenau
Head of Department, Institute of Media and Communication Science
<http://www-ifmk.tu-ilmenau.de/>
- Hornák, Zoltán
Budapest University of Technology and Economics
Department of Measurement and Information Systems
SEARCH Laboratory
<http://www.search-lab.hu/>
- Kerényi, Kristóf
Budapest University of Technology and Economics
Department of Measurement and Information Systems
SEARCH Laboratory
<http://www.search-lab.hu/>
- Miletics, Pál
Product Manager, Pannon GSM Inc.
<http://www.pgsm.hu/>
- Papolczy, Péter
Technical Manager, Fornax Inc.
Secure Mobile Payment Service
<http://www.semops.com/>
- Sas, Tibor
Hungarian Association of Content Industry
Business Development Director, Euronet Hungary Inc.
<http://www.matisz.hu/>
- Sipilä, Risto
Senior Manager, Business Development, Nokia Inc.
<http://www.mobilepaymentforum.org/>
- Tóth, Péter Benjamin
Legal counsel, ARTISJUS Hungarian Bureau for the Protection of
Authors' Rights
<http://www.artisjus.hu/en/index.html>
- Ünlü, Vural
Munich School of Management
Institute for Information Systems and New Media
<http://www.wi.bwl.uni-muenchen.de/>