

21世纪科技新视野丛书

New Horizons in The 21st Century's Science & Technology

(英汉对照读物)

◆丛书主编 吴文智 徐 新

THE FUTURE Telecommunication

未来通信

◆ 胡振明 杨丽 编译

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丛书主编 吴文智 徐新

编译 胡辰明 杨丽

策划 向云霞

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主 编：吴文智 徐 新

副 主 编：金光辉 王立非 张 权

编 委：王 坤 陈东东 李 瑛

梅智宇 李恩宁 王慧娟

电子编辑：靳红华 何 磊

序

人类社会进入 21 世纪的今天,科学技术日新月异的发展速度真正地到了匪夷所思的程度。那些在过去常常被人们认为不可能的梦想,今天大多成了事实。如果将来有一天你突然发现汽车可以像飞机一样在大街小巷穿梭飞行,或当你在某个餐厅就餐时竟然发现你对面就坐着一个与你百分之百相象的你,请不要吃惊,因为这正是现代科学技术创造的结果。

科学探索是一项伟大的冒险活动,充满了刺激与振奋。它使人类的求知欲和好奇心得到满足,并且益发地激起人们愈来愈大的想像力,去欣赏和理解科学技术所带来的种种美妙与神奇。e 时代的到来更使人们对知识的力量不再有丝毫的怀疑,唯有对科学知识的需求更多地增添了紧迫感。“让科学知识为我们插上腾飞的双翅”成了我们绝大多数人潜意识的追求,正是在这样一种背景下,我们构想了这套《21 世纪科技新视野》丛书。意欲从浩瀚的科学海洋中撷取那些对我们明天的开拓进取富有启迪意义的新知识,奉献给一切热爱学习,热爱科学的人们。

《21 世纪科技新视野》是一套以英汉对照方式编排的“语言学习+科技知识”的“链接”式丛书。在编写过程中,所有参编者遵照“应用价值、文化价值、精神价值”相结合的原则精心选择每篇文章,努力把最能体现人类创造力与想像力的科学成果介绍给广大读者,所有原文均摘自英语国家的现版期刊或网络杂志。英文地道,原汁原味。内容讲求知识性、趣味性、通俗性、新颖性,

使得广大英语爱好者在学习英语的同时可以接受新科学知识的熏陶，也使那些钟爱新科学知识的人们在掌握新知识的同时得以强化和提高自己的英语水准，特别是与这个时代特点相融合的那些“与时俱进”的科技英语水准。这在加入 WTO 后的今天尤为重要，因为 WTO 已不容置疑地把每一个中国人深深地卷入到了全球一体化发展的新浪潮中。作为链接未来科学技术的知识纽带——《21 世纪科技新视野》丛书，将把我们与新科学和新知识紧紧地联接在一起，从而为广大读者打造出一个再次提升自己的知识平台，以便可以从容应对 WTO 时代扑面而来的任何挑战。

如果本丛书的出版发行确能使读者对我们的上述编写意图认同十之一二，那就是对我们所有编写人员的莫大奖赏。此外，本书得以顺利出版，除了我们所有编写人员的努力外，还折射了煤炭工业出版社决策者的创新意识和与时俱进的奋发精神，渗透了本丛书责任编辑的辛勤汗水。在此一并表示感谢。

对于书中可能存在的不足之处，我们将在下次再版时改进，敬请广大读者批评指正。

《21 世纪科技新视野》丛书编委会

2002 年元旦于南京

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Forget the concept of the phone. And while you're at it, forget about phone numbers, too. Both will vanish when the third-generation mobile phone networks arrive in the next year or two. Your mundane mono-tasking mobile will be replaced by do-everything devices more like the communicators of Star Trek.

不要再提什么电话了；假如你还在用着电话的话，那就连电话号码也可以忘掉。今后一两年之内，第三代移动通信电话网络就将出现，那时，你再也用不着电话，更不需要电话号码了。那些功能单一的电话将被淘汰，取而代之的将是功能齐全的通信产品，这些产品甚至可以和星际旅行者的通信工具相比美。



Your Phone Is You

Before we let cellphones handle everything from opening our medical records to buying a house, Duncan Graham reckons we'll need to make sure people can't steal our identities.

It's getting hard to be anonymous. To do just about anything in this world you have to prove who you are. Want to buy something or draw some cash? There's a wodge of credit cards to lug around, and a plethora of four-digit PINs to remember. Even before stepping out of the front door you've got to find your driver's licence or rail pass, perhaps even your passport.

In a few years, this plastic and paper baggage could be history. A single chip hidden in your cellphone will be all you need—a little treasure that holds your complete identity. But beware, lose your phone, and your identity and your money *go with it¹. The big question is whether people will be willing to *trust so much to² a sliver of silicon.

Inside every digital mobile phone is a SIM card, SIM stands for subscriber information module, and the chip embedded in the SIM card is what makes the mobile yours. For now, the SIM just identifies you to the phone system, and maybe holds details of your favourite phone numbers. In future it could identify you to everyone who needs to know who you are.

To pay for a meal, say, you will use the phone to transfer mon-



你的电话就是你自己的身份

杜茨·格兰汉姆认为,在人们能够完全用手提电话来处理诸如打开医疗记录和购买住房等一切日常事务之前,必须先确保一件事:我们的身份不会被别人窃取。

信息技术使得个人的身份越来越难以隐秘。在现代社会里做任何事情都必须先证明你的身份。想购物或是提款吗?那么,有大把的信用卡供你使用,还得记住一大堆四位数的密码。想出门吗?那么,你最好检查一下是否带好了驾驶执照或通行证,或许还要带上你的护照。

再过几年,这些由塑料和纸制成的证件可能就会成为历史,你所要携带的只是你手机里一块小小的芯片,上面载有你的全部身份证明。但要注意:丢掉你的手机就意味着连同你的身份和金钱一起丢掉。因此,最大的问题是,人们是否愿意信任如此小的一块银色硅片。

在每一个数字式移动电话里面,都有一张名为“用户信息模块”的小卡片。正是这张卡片里镶嵌的芯片使你成为你手机的用户。目前,用户信息模块还只是向电话系统确认用户的身份,或许再记录几个你最常用的电话号码,而将来,这张卡片将能够向所有需要知道你身份的人表明你是谁。

例如,在餐馆付账的时候,你可以通过手机网络系统把钱转到

-
1. go with it: 一起丢失
 2. trust so much to: 放心地把如此重要的东西托付给



ey—or *the promise of it³—through the phone network to a restaurant's computer. There will be no payment slip to sign because your SIM will do it for you. Likewise, when you board a plane you won't have to wait in line for a boarding pass and seat number. Next year, the Finnish telecoms company Sonera will be setting up a WAP site that will let travellers do both before they even reach the airport. Unless they have luggage, there'll be no more queueing at check-ins.

Mobile misgivings

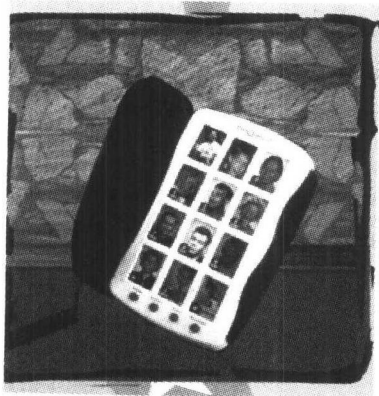
The Finnish government is looking at using SIMs in place of a national identity card—and eventually a passport. Under this plan, the SIM will become a person's legal proof of identity. And there's no reason why it couldn't unlock your health records, social security details and other personal information. One click and a hospital would know exactly who it's dealing with.

But for these dreams to become reality, there'll have to be a revolution in public attitudes. People will have to *let go of⁴ their apprehensions about e-commerce and learn to trust their mobiles. “Cultivating that trust is a very difficult thing to do and takes a lot of time,” says Ian Pearson, resident futurologist at British Telecom.

People can lose or mislay their phones: about 9000 a year are left on the London Underground alone. That's nearly as many lost mobiles as lost umbrellas. And they are a tempting target for thieves, who can easily *dispose of⁵ them on the black market. That's bad enough when there's only a large phone bill at stake. When your phone becomes the key to your identity, secrets and cash, you'll want to make sure it stays safely locked up, even if the gadget itself falls into the wrong hands.



餐馆的计算机里或是记下账单,再不必开什么手写的支票,你的“用户信息模块”已经为你做好了一切。同样,在登机前,也不必再排队领取登记证和座位号,芬兰索耐拉电信公司将于明年建立一个无线网络,以帮助旅客在到达机场前处理好这些事情。只要旅客没有行李需要托运,他们就不必在登记处排队了。



移动电话:让人欢喜让人忧

芬兰政府计划以“用户信息模块”来取代国民的身份证,甚至最终代替护照。根据这一计划,“用户信息模块”将成为个人身份的合法证明,因而没有任何理由不用它来记载你的健康记录、社会保险情况和其它个人资料——只要敲一下键盘,医院就会马上知道你的身份。

但要实现这些构想,首先要让公众的态度有一个巨大的转变。人们必须放弃目前对电子商务的理解,并学会信任他们的手

提电话。常驻英国电信公司预测专家伊万·皮尔森说:“要建立起这种信任非常困难,而且需要长期的努力。”

人们会遗失或误放他们的手机:仅在伦敦地铁,每年就有 9000 部手机被丢失在那里。手机的丢失数量几乎和雨伞的丢失数量一样多。手机还常常成为小偷的目标,因为他们很容易在黑市上销赃。一大笔电话费面临丢失的危险已经够糟糕的了,要让手机成为打开个人身份、隐私和现金的钥匙,人们无疑更需要确定,即使自己的手机落入他人之手,也会紧紧锁住里面所记载的一切。

3. the promise of it: 将会付钱的信用

4. let go of: 放弃,抛开

5. dispose of: 处理掉,这里指销赃



“Having something that contains all this information would be extremely rash,” says Roger Needham, managing director of Microsoft’s British research laboratory in Cambridge. “People will simply find it unacceptable.”

The solution, according to Needham and other experts, is to store precious information on secure servers accessible via a WAP connection or the Web. The SIM would only store a personal identifier—a long string of digits that would unlock the servers and give access to the information they hold. To use the identifier, the phone’s owner would have to *punch in⁶ a PIN.

The beauty of this system is that the identifier would act as one half of what’s called a public key encryption system. The identifier, kept safe inside the phone, acts as a key, known to no one else. To read a message locked with this private key requires a second, public key, which can be freely distributed.

You might use this set-up to send a request to a bank using its public key to see the details of your account, which it would decrypt using its private key. The bank would then send you the requested information encrypted with your public key, which only your private key could decrypt. Thus both messages would be secure.

An increasing number of countries are passing laws to give private keys the same legal force as signatures. This has *unleashed a flood of⁷ encryption systems, and the problem now is to get governments and companies to agree on a standard. “It needs to be simple, secure and transparent,” says Mika, head of mobile commerce company More Magic Software in Helsinki. “We have the maths to show that it is se-



英国剑桥微软研究实验室的经营部主任罗杰·尼德汉姆说：“带着一个存有所有个人资料的东西到处走太冒险，人们肯定无法接受这种做法。”

尼德汉姆和其它一些专家认为，解决的办法是将重要的资料保存在一个安全的服务器里，用户可以通过无线或有线网络进入其中。“用户信息模块”只存储着一个用户身份标志——键入一串数字密码就可以打开服务器并获得里面保存的资料。而要使用身份标志，用户还必须键入一个口令。

这种方法被称为“公共口令加密系统”，其过人之处在于，它由两部分组成，个人身份标志只是其中之一。个人身份标志被安全地保存在手机里，其作用相当于一道口令，只有用户一人知道。而要查阅由这道私人口令锁住的信息，还需要另一道由服务商随机分配给用户的公共口令。

比如，你可使用某家银行的公共口令向其申请查阅你的个人账户，银行会用其私人口令将你的申请解密。然后，银行会把你所要查阅的资料用你的公共口令加密并发送给你，这些资料只有用你的私人口令才能够解密。这样，双方传送的信息都是安全的。

越来越多的国家正在立法，给予私人口令与签名相同的法律效力。这使得各种加密系统纷纷出台。现在的问题是，政府和各企业需要共同制定一个统一的标准。经营移动通信业的赫尔辛基“莫尔魔力软件公司”的总裁迈卡说：“加密系统必须简单、安全、透明度高。我们有很科学的方法来检验其安全性，现在惟一的问题是如何把全

6. punch in: 用按键的方式输入

7. unleashed a flood of: 使得……大量出现



cure. The only problem now is making it global.”

The Finnish government *has taken the initiative with⁸ a national standard that companies can use free of charge, says Vesa Votka of the Finnish Population Register Centre in Helsinki. At the moment, this system—called FINEID—uses a smart card and a card reader attached to a computer, but the plan is to migrate to a SIM, says Votka.

The private key is protected by a PIN, and the card will shut itself off if wrong numbers are keyed in three times. To switch it back on, the owner must take it to a police station with another form of ID. If a card is stolen, the police will cancel it permanently. Either way, information on the card stays safe.

Even *in its embryonic form⁹, FINEID gives people a secure way to access sensitive information, says Votka. “And when you get it in a mobile phone you’re not even tied to a terminal,” he says. Needham believes that identity theft will be inevitable no matter how careful the safeguards are. “But then it already takes place now,” he says. He reckons the system is more secure than what we have now, and that this will encourage businesses to adopt it.

Pearson thinks consumers, too, will learn to trust a chip with their identity, not least because it will make life so much easier. A private key will do away with hard-to-remember logins and passwords for websites, as well as all those credit cards and PINs. “People already give up their privacy quite happily just to get access to a website,” he says. “As long as they get something out of it.” People don’t really value their personal information, it’s the control of it they care about. Your SIM will give you that control.

(From www. Yahoo. com)



世界的标准统一起来。”

据赫尔辛基芬兰人口登记中心的威萨·瓦特卡讲,芬兰政府已在这方面迈出了第一步,为国内企业制定了可以免费使用的国家标准。瓦特卡还说,目前这种被称为 FINEID 的系统使用一种智能卡和与计算机相连的读卡器,但正计划向“用户信息模块”发展。

私人口令还受密码保护,如果错误密码键入三次,芯片就会自动关闭。机主要想重新把它打开,必须携带其它形式的身份证明去警察局进行处理。如果卡片被盗,其卡号会被警方永久性废除。因此无论遇到什么情况,保存在卡片里的资料都会安然无恙。

瓦特卡认为,尽管 FINEID 系统尚未完全成型,但它已经能为用户保管敏感资料提供一条安全的途径。他还说:“用户加入该系统之后,甚至不必固定使用一台终端机。”尼德汉姆则认为,无论这些系统采取怎样的安全措施,身份被窃的案件都是不可避免的。但他同时也承认,“这些新技术已确确实实地走进了人们的生活。”他相信这一系统比人们目前所使用的方法更为安全,能够鼓励商家竞相采用。

皮尔森也认为,用户会逐渐信任载有他们身份证明的芯片,因为这至少能使他们的生活变得更加便捷。用户只要记住一道简单的私人密码,就不必再为那些难背的登录命令和网站登录密码所烦恼,也不用再携带大量的信用卡和其它证件。他说:“现在为登录一家网站,人们已不在乎公开一些私人情况,因为他们觉得能够从中受益。”其实,人们真正在意的并不是他们的个人资料,而是他们能否有效地控制这些资料。“用户信息模块”就能够给予用户这种控制能力。

8. has taken the initiative with: 在某方面已经迈出了第一步或领先了一步

9. in its embryonic form: 在其尚未成型的阶段



You Are Here

We can track everyone all the time, so no one need die for lack of emergency services. But is the loss of privacy acceptable, or even necessary? Mark Schrope finds out.

QUICK! You desperately need a cab, but can't see one anywhere. Or you've *broken down¹ on a country road late at night, but don't know where on earth you are. Or perhaps you're new in town and have a craving for pizza. But where is the nearest Italian restaurant?

In a few years' time, you won't think twice about these problems. A quick call from your mobile to a website will solve everything. In the US and Europe, cellphones will soon be able to pinpoint their location. This will open the door to *a vast range of ² new services. Working out your position instantly, remote taxi-hailing and finding a restaurant are just the start. You need never be lost again.

The drive to improve location fixing started with the US Federal Communications Commission. It wants to ensure that emergency services can pinpoint people who call in from mobiles but don't know where they are. The FCC ordained that by this time next year all operators of cellular networks in the US must have decided how they intend to locate mobile phones. They must then put those plans into action. "I think that the world is watching what's happening with the FCC as a benchmark," says Melanie Cox of the British-based company Cambridge Positioning Systems. Though the European Commission wants similar plans in place