



*What will the software industry look like in 3, 5, even 10 years from now?*

The software industry is one the most dynamic markets in the world - just think about the way it went from the software development for mainframes in the 60s through PCs in the 90s and now cell phones. The developers may be the same, even the programming languages have not changed much, but the way how the user installs and works with software has changed dramatically.

Software on PCs will not disappear, but it will be surrounded by much more software on mobile devices and on huge server farms where memory and execution speed is cheap and virtually unlimited capacity on demand. The software of the future will not be running in isolation - everything will be connected. Such connections will change all the time and a lot of connection will be anonymous and very temporary. Just as today we surf the web of information, in the future we will use the web of connected software applications. Such connection will be established directly in the cloud between different web services as well to all kinds of computers and mobile gadgets through providers, process filters, connection points, and a lot of new types of communication levels we don't know about today.

There will be not many changes in the way software will be delivered and purchased; we will continuously see a lot of open source solutions - especially around operating platforms, communication logic, standard libraries, databases etc. But a lot of software products are very specialized, expensive, and need professional support. So I don't expect a dramatic change in the constructive coexistence between open-source, freeware, trial ware, leased and perpetual-licensed software. But software vendors need to be more flexible in providing different license models to different customers for commercially sold software products: the day when a software company just provided one license model and expected that all customers would

accept it is gone.

*And what customer demands and business trends will drive changes in software products, how they're developed, and the industry that provides them?*

I see two intellectual challenges that have to be addressed. First, how do we control access to secure or private information as well as execution of secure or private applications? Today a lot of this access is physically controlled; if you want to use your credit card, you have to get it from your wallet. But tomorrow your credit card is probably stored in your cell phone. This added convenience comes with increased potential for risk: how do you guarantee that no one can use your card without your permission?

The second challenge is the protection of software itself - or more precisely the licenses of the software applications. Licensing of software is already a challenge today. Compliance is difficult: you need enough copies to be legal but no more than necessary. Cheaters still try to get licenses for free. Pirates try with malicious attacks on license management systems to crack the software protection. Leasing or pay-per-use models could be more efficient for both software vendors and users, but technical issues frequently prevent their wide availability. All these limitations around software licensing exist today with software on a local computer and a vendor who knows who bought it. In the future world of connected software, millions of different software packages will be able to call each other and on-demand systems will frequently change the number of simultaneously started software copies. Then there are the providers of the cloud hardware, the software platform infrastructure and the connection management who want to get paid, maybe on demand by the user, or perhaps from the installer of the software products. And at the very end is a user who is ready to pay a fair amount of money to get a service thru this connected-software puzzle.

Both challenges will be solved by new standards for data and license protection in a connected world of cloud computers and mobile devices. Just as today we use local area network standards with security settings and get licenses through activations or other protection mechanisms, we will have standards in the web that guarantee only authorized users and software callers can use specific data and specific software products. And the payment system will probably be similar to the we pay for our products today - some share to the credit card company, some share to the store, some to the delivery company, some to the wholesaler/distributor, and the rest to the product developer. Much more complex, much faster but still more reliable and more flexible! Users don't see this payment splitting process today and it is unlikely they will see it tomorrow in the world of connected software.

Our company, Wibu-Systems, is currently working with several research groups around the world to develop effective cloud-computing software protection, licensing, and payment systems. We recognize that a lot of smart people in the world see the same challenges and we are very confident that in the near future we can provide solutions for the two challenges I have described

*This interview was published in SIIA's [Vision from the Top](#) , a Software Division publication released at [All About the Cloud](#) 2011.*