

# Digital Property Distribution - Useright not Copyright

## 1. The Emerging Digital Property Marketplace

**W**e are rapidly evolving an information-based economy and society: fewer and fewer factory and agricultural workers, more and more information workers. I'm using information in a broad sense - including things we are more used to calling entertainment products. As the world goes digital, music and video, to mention two prominent examples, take on classical characteristics of information, with watershed consequences for their marketing and distribution.

### 1.1 Understanding 'Digital'

If you are old enough and have a good memory, you may be familiar with the term analog computer used in contra-position to digital computer. These days you rarely hear either term. Digital computers are so much the norm that the distinction is no longer made, and hasn't been for decades. If there ever was a contest between the two technologies for building general-purpose computers, digital won. But the distinction is current in communications media, particularly telephony and television, and digital technology is taking over in those domains as well.

### Useright Supersedes Copyright in Cyberspace

RightsMarket encrypts digital content, meters usage, authenticates the user, provides authorization, and creates a transaction log for reporting and billing purposes. As a result, RightsMarket provides persistent digital rights management for software, text, knowledge, data, music, videos, and photographs even while running disconnected from the Net.

#### Useright

RightsMarket implements useright. Useright is the right to use. For example, a person might be given the right to use a document. This may give him permission to read, print, and copy the document.

#### How It Works

RightsMarket implements useright in a proactive manner. For example, a person who does not have useright for a document will not even be able to open it, preventing violations of intellectual property rights. This is very different from copyright, which is a reactive method of protection. Under copyright, a rightsholder must catch a violator and react to a violation with legal action.

RightsMarket enforces userights by:

- persistent encryption - each property is encrypted and is only decrypted while the user is using it.
- authentication - each user is authenticated ensuring that rightsholder knows who uses a property.
- permission - the rightsholder can set the permissions for each user, allowing control over when and how the property is used.
- usage tracking - usage tracking provides a record of when and how a customer used a property.

No matter where the digital content goes, or how it gets there, the terms and conditions of the rightsholder are enforced.

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This paper addresses both the marketplace and the technological contexts of a core software technology for proactive digital rights management. The emergence of a digital marketplace for intellectual property (IP) and the role of the Internet redefines what we mean by digital and digital property. The key ideas compelling a new digital marketplace for IP are digital production, consumption and distribution. Digital commerce is described as a special case of eCommerce (electronic commerce) and the general characteristics of earlier versus later markets are discussed. A model of the core processes of digital commerce is presented and related to RightsMarket, a technology based on the concept of 'useright'. Useright is contrasted with copyright and useright technology is shown to be at the heart of Superdistribution, the resistance-free flow of digital property in cyberspace. Different design choices (heavy and light) for the implementation of useright technology, and consideration of three perspectives of trust in a useright implementation are discussed. The latter sections of this paper provide more specific information on RightsMarket as an implementation of useright (architecture, functionality) and suggestions for its areas of application (health systems, electronic books, software).

Cet article traite des aspects commerciaux et techniques entourant une technologie logicielle de base servant à la gestion proactive des droits de propriété (IP) des données numériques. L'émergence d'un marché des droits de propriété intellectuelle des données numériques est en train de redéfinir ce que l'on entend par « numérique » et « propriété intellectuelle des données numériques », le rôle d'Internet et les caractéristiques générales des marchés antérieurs par rapport à celles des nouveaux marchés. Les principes clés qui sous-tendent le nouveau marché des droits de propriété intellectuelle des données numériques englobent la production, la consommation et la distribution. Le commerce des données numériques est décrit comme étant un aspect du commerce électronique (eCommerce). L'article présente un nouveau modèle sur les opérations de base du commerce numérique reliés au marché des droits de propriété intellectuelle (RightsMarket). Il présente les concepts de droits d'utilisation et de droits d'auteur. La technologie des droits d'utilisation est décrite comme étant au coeur de la superdistribution, le flux sans résistance des droits de propriété numérique dans le cyberspace. On y discute des divers types de conception (lourde et légère) pour la mise en application de la technologie des droits d'utilisation, en prenant en considération trois niveaux de confiance. Les dernières sections de l'article contiennent des renseignements plus détaillés sur le marché des droits de propriété (RightsMarket), en ce qui a trait à la mise en application des droits d'utilisation (architecture et fonctionnalité), et des suggestions sur ses domaines d'application (systèmes de santé, livres électroniques et logiciels).

Here's a simple definition. Computing or communication is digital if the information being computed or communicated is in digital form, i.e. numeric, encoded in digits. Note that this definition explicitly references the computing/communications context. Arguably, if I write my phone number on a piece of paper and hand it to you, or speak the digits to you, we have communicated digitally. But that's not what we typically mean by digital communication. Machine-readable or computer-processable communication is implied by the term.

We are most familiar with the 10 digits of the decimal number system. Whatever the base of the number system employed (2, 8, 10 and 16 all get some play), once the information is encoded in numbers, it can be:

- reproduced and transmitted with almost unlimited accuracy, and
- subjected to mathematical analysis and manipulation (encryption-decryption, hashing), notably for ensuring transaction security and controlling access.

For perspective, here's an example of 'then and now'. Building designers used to make scale drawings on paper with ruler and pencil, and type up a bill of materials (or material take-off). The outputs, drawings and reports, were not digital. The only processor that could do anything with them was a human who understood the designer's conventions for representing buildings and their construction. Communication was by paper. (Oddly, fax is arguably digital, but a red herring in this context.) Now the designer employs very sophisticated CAD (Computer Aided Design) software to produce the design. The fundamental product is a digital file that can be processed by the CAD software to produce drawings and reports. It was born digital, and it can be transmitted, modified and used in digital form.

### 1.2 Digital Property

When the information has property characteristics, like an owner and salable value, we are likely to label it intellectual property (IP). IP is produced by knowledge workers such as engineers, writers, scientists, and software developers, and entertainers such as musicians and movie-makers. We're used to printed things like books, magazines, song lyrics, and investment advice letters being referred to as information. It's not a big stretch to include computer programs and chemical plant operating instructions. We're not so used to audio recordings, videos, paintings, and movies being treated as information. But understanding the information nature of these intellectual properties, as they are now represented in computing and communications devices and media, is key to understanding the drastic changes in their marketing and distribution that are now taking shape.

The role of the computer in the production of IP is now familiar: consider word processors, engineering design tools, drawing programs, sound and image editing programs, and computer aided software engineering. Over the last several years, the computer has become essential to the production of all forms of IP - an indispensable tool for most knowledge workers, producing reliably reproducible IP in digital form - digital property.

### 1.3 Digital Distribution - The Internet

More recent developments in computer communication are changing the way IP is distributed. The phenomenal growth of the Internet, a universal network of computers communicating digitally, and the World Wide Web, a universal interface and organizational standard for digital content on the Internet, have given us a cheaper, faster, and more manageable (by computer) means of distributing digital property. Maybe most IP will be distributed on the Web someday soon. Paper, disk, tape - just too slow, expensive, and functionally impoverished compared to the Web.

But there are problems to be solved. The openness and universality of the Internet create big challenges and cogent questions, chief among them:

- Rights management - how does the marketplace protect the IP owner's rights when communication and copying are so fast and easy?
- Measured use - how does the marketplace reliably measure IP usage to enforce fair-use policies that will encourage IP owners to participate in the marketplace?
- Secure payment - how does the marketplace ensure payment according to agreed terms and conditions and prevent fraud?

Many suppliers are striving to provide software, hardware, standards, and operating procedures to make an organization successful in the new

IP marketplace. 'The worldwide marketplace' will consist of many marketplaces with many marketplace operators. Some but not all of the marketplaces will be linked on the Internet. Not all operators will deploy on the Internet - some will chose a LAN using Internet technology and standards. Not all operators will be concerned with collecting payment - some will just want to manage the distribution of IP in a secure, informed way.

### 1.4 Characterizing Initial and Later Markets

Digital markets are in the formative stage. Distributors of information products such as books and financial advice newsletters are planning to offer their existing clientele an alternative form and means of delivery, but not change their business model a great deal in the early market. We generalize the characteristics of the initial market in Table 1:

**Table 1: Characteristics of the initial digital markets**

Customer id	Customer is well-known to the seller because the seller: <ul style="list-style-type: none"> <li>• maintains a customer account, including details of past purchases.</li> <li>• most often takes payment by credit card.</li> <li>• has a shipping address, probably an email address, and maybe a credit card statement address.</li> <li>• often has customer-stated profile and preference data.</li> </ul>
Payment	By credit card; pre-payment or on pre-established credit.
T&C	Terms and conditions are kept with the seller (the account keeper); one or a few options for all; sales/support team interprets them to customer.

We call this model of the early market the utility model, because several of its characteristics suggest doing business with a telephone or power company. It is account-based commerce, as opposed to later markets when cash-based commerce will evolve and coexist with account-based business. We characterize this cash-based aspect of the later market in Table 2:

**Table 2: Characteristics of the later digital markets**

Customer id	On individual purchase, customer may be unknown to the seller.
Payment	By anonymous digital cash [4]. Using digital cash, the purchaser cannot be identified, even if he does have an account with the seller. Compare to a gasoline purchase. Pay with the oil company's credit card and the sale is related to a known customer with an account. Pay with cash and the purchaser is anonymous, even if he has an account.
T&C	Terms and conditions are packaged with the product and circulate with it. All transaction information (if paying with digital cash) is local.

This might be called the grocery market model, because it suggests picking product off the shelf, looking at its packaging and price, and placing it in the shopping cart with other individually inexpensive items. We are not willing to predict how soon and to what extent the grocery model will evolve. But we are sure the utility model will dominate early markets and will always have significant market share.

## 2. Core Processes of Digital Commerce

We have come to understand eCommerce as the promotion and selling of goods and services over the Internet, such as books and haircuts. The purchase transaction is over the Internet and fulfillment is usually by mail or in person. Digital commerce is a special kind of eCommerce where the goods are digital, such as digital books. In the usual case, both the purchase transaction and the fulfillment transaction occur over the Internet, but in some instances the user has his/her copy before use-right is obtained, see Superdistribution below.

Many of the core processes of digital commerce are the same as for eCommerce. A model of these processes is presented in Table 3:

**Table 3: Core processes of digital commerce**

Macro-process	Micro-processes
Content Management	create digital property, do creative packaging, prepare for search of content, wrap property (encrypt, and package or place in container)
Tool Creation	make the tools for the end user (client-side software such as readers and account administration software) and the publisher/distributor (server-side software such as property wrappers, and property and customer administration software)
Marketing and Sales	compose terms and conditions of use (specific and general contract), promote, advertise, offer, sell and take order (get agreement to terms and conditions, grant useright), service customer re product (e.g. handle fit-for-purpose complaints)
Transaction Processing - Financial	order physical shipment, calculate and receive payment including shipping charges and tax, collect, clear financial payments
Transaction Processing - Rights	authorize use, meter use, provide secure communication between client and server to effect the two-way asynchronous communication; clear information on authorizations and metering to stakeholders
Product Fulfillment	fulfill order (e.g. push on Net, superdistribute, ship physical), make available (e.g. useright holder pull from Net, superdistribute)
	service customer re financial transaction (e.g. handle billing inquiry), service customer re rights (e.g. handle rights inquiry, notify re rights)

RightsMarket technology fits into two macro processes in this model: Transaction Processing - Rights, and Tool Creation (see Overview of RightsMarket below).

### 3. Useright and Useright Technology

Definition: useright, the right to use; contrast with copyright, the right to make or possess a copy.

#### 3.1 Useright Contrasted with Copyright (Table 4)

Copyright law is a tool for reactive protection of intellectual property rights. Useright technology is a tool for proactive protection of the same rights. Copyright law was born and raised in the print world, and lawmakers and rightsholders are struggling with its application in the new digital world. Useright technology is a creature of the digital world on two counts: it is a digital Internet technology, and it applies to distribution of and commerce in digital properties, including text, image, audio, video, and multimedia.

Copyright is described as 'reactive' because, to protect her rights, a rightsholder must catch a violator, and then react to the violation with legal action (if she has the resources and judges the cost/benefit/risk to make it worthwhile). Useright technology is proactive because it's employed to prevent violations, and therefore preclude the need to catch and react. These tools are not opposed. Use of the technology is legitimized by the intent of copyright law, and in case the intent of the technology is defeated, a rightsholder may invoke the law (although it may be contract law, rather than copyright law).

The word copyright is being used in two senses in this context. In Figure 1, we have coined the term IPright to distinguish them. Due to centuries of use, copyright has occupied the meaning space labeled IPright above. Thus it's been said "useright enforces copyright in the

digital world". It's correct if "useright enforces IPright" is intended, wrong if it means 'useright enforces copyright law', and confusing if the distinction is not understood. Useright is employed in the digital world to achieve the same goal that copyright law supports in the print world.

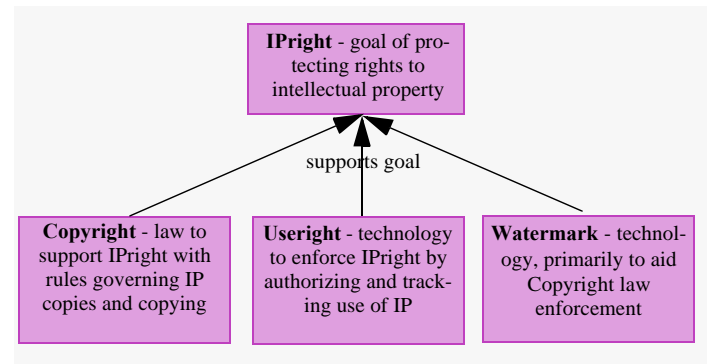


Figure 1. Two Meanings of 'Copyright'

Copyright law is a very imperfect tool for protecting intellectual property rights. In the print (or physical) domain, unauthorized copying and distribution are inhibited by time and expense. These impediments are almost totally removed in the digital domain of the Internet, and something more effective than legal rules about copies and copying is needed. Useright technology is an answer.

**Table 4: Comparing Copyright and Useright**

Copyright	Useright
Rights enforcement is based on physical possession of copyrighted material.	Physical possession is not important.
Physical possession triggers payment.	Usage triggers payment.
The courts, lawyers, and the police are used for enforcement (provided it's worth reacting after the fact of rights violation).	Technology is used for rights enforcement.
Copyright was designed for the physical world of intellectual property.	Useright was designed for the Cyber-space world of digital intellectual property.
Relatively small number of pricing options.	A different price for every individual is possible.
Copyright is well understood and enforced by law in many jurisdictions.	Useright is a new concept.

#### 3.2 Superdistribution

Useright technology is the technological heart of an implementation of superdistribution, as explained by Brad Cox [1]. The name is chosen in analogy with electrical current superconductivity - digital objects flow without resistance in cyberspace. Rightsholders encourage copying and don't care which medium (a Net, DVD, floppy disk) or even how many different media, deliver the goods to the end user. Currently music and software on a CD are in digital form, but they are not superdistributed. Rightsholders charge for a copy of the physical form and try to prevent copying by others. The digital property is 'locked-down' to a copy of the physical medium.

Technology that enforces useright authorizes and meters (or measures) the use of digital property, every use, every time. For context and comparison to the familiar, consider four stages in the life of a fictitious

book titled ABC.

- Born digital: ABC is written using a word processor on a desktop computer.
- Commerce: Thousands of physical copies of the book are printed and sold in bookstores. The publisher also delivers ABC by mail after taking direct orders by mail or phone.
- eCommerce: Internet booksellers such as Amazon.com take orders for the physical book over the Web, and deliver it by mail or courier.
- Digital commerce: Internet booksellers offer the book in digital form, perhaps in addition to physical form.

To make superdistribution viable, a system to protect digital property and require useright is needed. Illustrating with the ABC example, it operates as follows. ABC is digitally wrapped, i.e. encrypted and packaged with identification and descriptive data. This form of book has been dubbed an eBook, so let's call this one eABC. Internet bookseller IBS freely supplies eABC from its website, and promotes the unimpeded copying of eABC in cyberspace. The author makes it available from her website. Other websites offer it as a service to attract traffic. Readers email it around.

To decrypt eABC and make it usable, a reader must obtain operable (in the useright system) confirmation of her right to use eABC. IBS is really selling useright - the copy is free and can come from a friend. In one mode of operation, upon first attempt at use, a reader is connected to a useright server on the Web where she can obtain useright by agreeing to terms and conditions of use, including payment if applicable. But this is not the only possibility - see below, Useright Implementations. The useright system works in the background to ensure only authorized users get to use eABC. No useright, no use. Useright might be unlimited, or limited by duration, date, count,...., just about any computation.

### 3.3 Heavy and Light Useright Implementations

Here we describe two possible characterizations of useright technology labeled according to the 'weight' of the digital package and the client side of the client-server system (Table 5). This is an oversimplification, since actual implementations may combine characteristics from each, may be able to accommodate both, and may evolve away from either or both. It is useful for scoping implementation possibilities.

### 3.4 Trust - The Owner Perspective

The rightsholder's issue is property security. Can the author trust the market operator to adequately protect her intellectual property in digital cyberspace? As with all measures taken to enhance security, it's a game of leapfrog between attackers and defenders. There is no perfect defense, at least not for long. Human creativity invents a good defense, and then other ingenuity attempts to defeat it. Defenses are continually being developed, breached by a few, and improved before many are informed or motivated enough to push through the breach. Tragoes (and others) will be playing leapfrog with attackers as long as there are useright implementations, but the time between jumps may lengthen out a lot over a few years. The immediate result, however, will be greatly enhanced security and risk reduction.

Property security is largely a market or business issue, even if the property is not for sale. It must be balanced with end-user convenience and the cost of defeating it. Contrast a physical book with its eBook form. A physical book pirate can photocopy the book, in whole or in part, perhaps many times. The pirate can even get a digital copy by data entry or scanning and conversion to text by OCR - optical character recognition. The physical book publishing industry lives with this kind of piracy - it's rare enough, and recourse to copyright law is effective enough, that the industry is still viable. For eBooks, even if all other attacks could be defended perfectly, the pirate could photograph the screen and get a digital copy by scanning and OCR.

How much property security is needed? Not so much that the end user is inconvenienced a lot. Enough that a pirate is inconvenienced a lot.

**Table 5: Useright: lightweight and heavyweight implementations**

Characteristic	Lightweight	Heavyweight
Properties in the package or 'container'	One, or several of the same type e.g. several HTML pages.	Many, and of different types, e.g. for a song, the audio, liner notes, photo of the overpaid rock star.
Locus of the terms and conditions	Server - user needs to connect to the server to agree and get useright	Property - T&Cs are in the package and can be agreed off-line from the server
Feel of the transaction	Subscription buying - agree and pay in advance of delivery	Grocery shopping - agree (select) without interaction or observation, or even purchaser identification
Flexibility T&C options, makeup	Unrestricted - server is hugely scaleable	Restricted - practically, client must fit smaller 'information appliances'
Client size and complexity	Smaller	Larger, to unpack, offer terms, invoke processor according to property type

### 3.5 Trust - The User Perspective

The user's issue is privacy - security of personal information, and use of personal information. There is great potential for abuse of personal information in digital commerce and useright technology. A market operator will need to earn the trust of the user with carefully thought through and obviously exposed policy on collecting and using personal information. It's good business. Schwartz [3] argues that trusted brand names matter even more on the Web. There is growing help for both user and market operator. For instance TRUSTe asserts "... we're helping Web users and publishers deal with privacy on the Web". See [www.TRUSTe.org](http://www.TRUSTe.org).

### 3.6 Trust - The Market Operator Perspective

To satisfy both rightsholders and users and build a successful business, a market operator requires adequate property security and privacy. The operator must also safeguard transactions - both financial and rights - to prevent fraud. He must reasonably trust the useright system to communicate securely over the Net, and to protect and hold tamperproof useright information on the end user's machine.

## 4. Overview of RightsMarket

Our implementation of useright technology is a Web-based client-server system incorporating the concept of Trusted Tools for using passive digital properties like documents and audio recordings. Active properties (i.e. programs or executable software) are handled in the same architecture, but they are trust-enabled themselves - they are the tool.

### 4.1 Architecture

Figure 2 shows the gross software structure of RightsMarket. Consider documents as representative of passive properties. In the RightsMarket architecture, a Trusted Tool is a program that can be trusted to handle protected documents according to the rightsholder's terms and conditions of use, and to treat unprotected documents indifferently as far as this trust relationship is concerned. Many common applications, including word processors, document viewers, and Web browsers will be trusted in this sense. The favored strategy for making a tool trusted is to extend it through its application program interface (API) so that it dialogs with the RightsMarket client for authorization and tracking use of the document. A strength of this architecture is that many common tools and tool sets, including Adobe Acrobat, Microsoft's Office suite, and Microsoft's and Netscape's web browsers are designed to be extensible by independent developers. Tragoes has made Acrobat Reader and Netscape Navigator into Trusted Tools with plugins to prove that the architecture is conceptually sound and make secure document distribu-

tion possible within the Acrobat family of publishing tools and on the Web. We will soon make Microsoft Internet Explorer trusted.

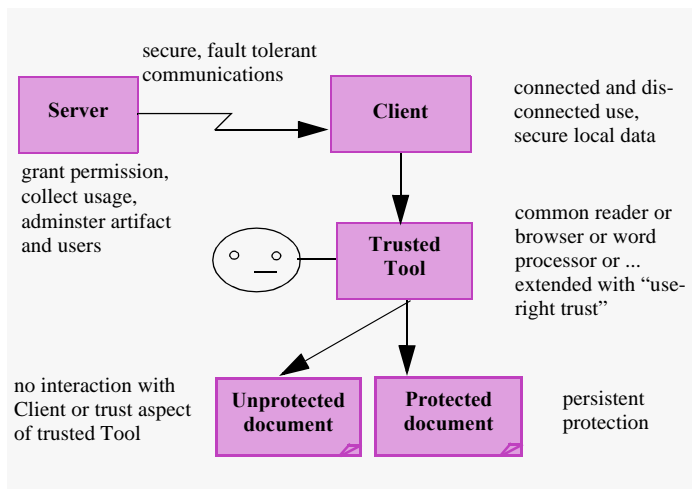


Figure 2. RightsMarket Architecture

#### 4.2 Functionality

RightsMarket authorizes and meters the use of digital property, macro-process Transaction Processing - Rights in the model above. The system maintains a database of artifact (wrapped digital property), user, permission or useright, and usage data in the server database. Two editors and a reporting tool are provided to maintain and display this information. Although these editors are sufficient to maintain the artifact and user database, we anticipate that many applications will maintain this RightsMarket information automatically, through a programmatic interface with information feeds from integrated customer, product and rights systems. A wizard is provided to wrap HTML pages, and Acrobat Exchange is extended to create PDF artifacts.

The RightsMarket client communicates with the RightsMarket server to effect authorized access to digital property through a Trusted Tool. (When not dealing with a wrapped property, the Trusted Tool behaves exactly as if it had not been useright enabled.) It acts as a proxy for the server, securely storing permission and usage data and enabling off-Net use of digital property.

RightsMarket does not do digital property management, search or delivery. It does not show catalogs, take orders, or do customer management or billing. Table 6 details a little more of what it does do.

**Table 6: Understanding authorized and metered use of digital property**

Function	Provides	Enables
Authorize use	security of property - the assurance that every user is bona fide user, i.e. has agreed to the rightsholder's terms and conditions of use, no matter how the property was received; no agreement, no use; use is authorized every time, even for off-Net use	freedom, to a high degree, from concerns about illegal digital re-distribution; knowing exactly who the user community is; free choice of distribution channel - Net pull or push, broadcast, point-to-point, CD, DVD
Meter use	use tracking to chosen degree of detail; specific to the terms and conditions of use of property; tracking actions such as viewing, printing and copying; user characteristics such as student status or department affiliation, and use characteristics such as duration or time of day	marketing and charging schemes such as initial free use, pay per use, rent to own, and volume discounts; gathering market intelligence independent of charging; automating one-to-one service and marketing [2]

## 5. Application of RightsMarket

RightsMarket authorizes and tracks the use of digital property using the Net as a transaction and communication channel. ('Net' can mean the world's Internet, or one organization's Intranet or Extranet.) User advantages include price, delivery speed, and the superiority of intellectual property in digital form (e.g. ability to search, link and update). Rightsholder advantages include cost, delivery speed, understanding of utilization, and effective rights management (e.g. ability to limit distribution to a known audience, require payment for use, and restrict use to given operations for a given user).

### 5.1 Application Areas: SDR and Digital Commerce

We see two broad application areas for useright technology:

- Secure document redistribution (SDR), where an organization is primarily concerned with protecting digital property and defining precisely who has the right to use it, and when. Applications include medical records, distance education, and securing the non-public documents or non-public Web pages of an organization (e.g. R&D company, government department, military or police department).
- Digital commerce, where an organization is concerned with servicing a market, for profit. Applications include the publishing of text, music, video, multi-media and computer programs.

RightsMarket will typically be integrated with other systems to form a complete solution. In the case of secure document redistribution, this might be the document production system, in which word processors and Web authoring tools are made into Trusted Tools. For digital commerce, it might be typical eCommerce elements such as a Web-based catalog and shopping cart, and a credit card payment processing system.

In secure document distribution: The requirements are:

- wrapping: the capability to wrap (protect, identify, describe) digital property
- tooling: extending common computer applications to become Trusted Tools
- authorization: restriction of access to authorized users,
- metering: tracking the particulars of use (e.g. opened by user U at time T), and
- information clearing: distributing authorization and metering information to stakeholders.

For digital commerce: The requirements are the same as for SDR, as well as:

- selling: promoting and offering product,
- order processing: taking and fulfilling orders, and
- financial clearing: receiving and distributing payment.

### 5.2 Scenario - SDR, Health

Here are some suggestions on employing RightsMarket technology in an electronic patient record (EPR) system.

- Protection** A medical report is automatically wrapped as it is created. As we use the word here, a report is part of a patient record.
- Useright** Certain people might be given useright to the report automatically because they are members of a defined group, say all of the medical caregivers in an organization. Or, perhaps only the creator, say the primary caregiver, has useright initially, and all others must individually acquire useright as needed. Useright policy is systematized.
- Authorization** Each time someone attempts to use (view, excerpt, print,...) the report their right to use the report is verified. No useright, no use. The system works even off-line from the Net, so if a legitimate user has the record on her laptop, she can use the report even if a Net connection is inconvenient.

- **Digital** RightsMarket operates on the Internet/WWW platform, with security built-in. This yields many advantages of digital communication (e.g. useright granting), digital distribution (e.g. secure, non-repudiated delivery), and computation (consolidating and excerpting). RightsMarket can be deployed on the public Internet, or a private network using Internet technologies.

- **Metering** Uses are tracked or 'metered', i.e. a log of usage is kept, even off-Net. This has helpful implications for implementing convenient on-Net consultation. E.g., a doctor in Kalispell has a lab report and wants to consult an expert in Berlin on it. The Berliner is known to the system, but does not have useright to this report. The Montanan sends two emails, 1) to the Berliner with his questions, attaching the lab report, and 2) to the RightsMarket system, effecting automatic granting of useright to the expert for 48 hours. Both emails are digitally signed, so there is no doubt who sent them. Because the system tracks all of this, there is no need for more human *a priori* control in the consultation-useright-granting process. It's enough to know that a reliable record of use can be checked.

### 5.3 Scenario - eCommerce, eBooks

These days books are created in digital form, then manufactured and distributed in an expensive, resource-consuming process. In the wired world, some books will be sold in both physical and digital forms simultaneously - the digital form being an inexpensive add-on to the physical book meant to increase sales volume. And some books will just stay digital and never be cast in a physical form. Paper encyclopedias are too big and expensive, and too hard to search and cross-reference compared to their digital form. A digital golf instruction book can show the proper swing with animation, and play the sound of a properly struck sand shot.

Some suggestions for applying RightsMarket to eBooks (see Superdistribution above) follow.

- **Protection** After the author completes the master, the digital book is wrapped, and the unwrapped version is sent to manufacturing.

- **Useright** Internet booksellers offer the digital book as well as the physical book. The eBook can be available well before the physical book. Readers buy the eBook off the Web and take delivery immediately. The sight-impaired population benefits immediately.

- **Authorization** If the eBook is purchased off the Internet bookseller website, authorization is delivered at the same time as the eBook. She can read the book when it arrives. If another eBook is emailed from a friend, she will need to go to the website to buy the eBook, but not to download it. If she runs out of space she can delete the book. She can always get another copy from somewhere.

- **Digital** She can search the eBook. For example, suppose she is reading an encyclopedia of biographies of music makers - thousands of them. She can find the entries for Bach and Mozart to see who influenced them - no real advantage over the paper book. More impressive is the fact she can quickly find every other music maker that was influenced by both of them. The biographies can play bits of music, and they can link to complementary Internet resources, or to other books.

- **Metering** The retailer can implement a pricing scheme that allows, for example, anyone to use the eBook once for free. Only on the second use will the reader need to pay.

### 5.4 Scenario - eCommerce, Software

Any program can be turned into a Trusted Tool by programming it to check for useright and to meter use. Superdistribution was originally envisioned to support the creation of multi-property applications by providing software developers with a means to understand and charge for their contribution to the complex whole.

- **Protection** The program is augmented with calls to the RightsClient to authorize use, and track other significant events, if any.

- **Authorization** When the program is started it asks the RightsClient for permission to execute for the user. (It can ask at any time, but we expect start-up will be most common.) It's possible that a program might authorize more than once. Perhaps it re-authorizes at every major menu selection, so the terms and conditions of use cannot be defeated by simply never shutting down. Or maybe it's a multi-property program (Ann wrote the sort routine) and the properties are independently authorized and metered. Of course the user is party to this authorization only rarely - most of the time the RightsClient answers without user intervention.

- **Digital** The new networking capabilities offered by Internet technologies allow almost any two programs in the world to collaborate.

- **Metering** A program can also meter (measure use, or signal significant events) at various times. For example, Ann's sort routine reports the number of items sorted each time it does a sort, and she uses this information to negotiate her cut of the user fee.

### 5.5 Product Availability

RightsMarket is developed on a four-month release cycle. Information on its features and functions, a tutorial and demonstration software can all be found at Tragoes' website [www.Tragoes.com](http://www.Tragoes.com). We anticipate the technology will initially be applied according to the utility model of eCommerce, e.g. eBooks, and to secure document distribution, e.g. electronic patient records. RightsMarket is offered on licensing and royalty terms.

## 6. References

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## About the Author

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He is Chairman and Vice President of Development of Tragoes Inc. (CDN - TRGO), a Calgary software development firm specializing in Internet eCommerce infrastructure. Merv's 30-year career in software development spans applications in science, engineering and business. He has worked for large multi-national firms and co-founded a few small ones, including Tragoes.

