



WHITE PAPER

MANAGING VALUABLE IMAGE ASSETS
USING DIGITAL WATERMARKING FOR COPYRIGHT COMMUNICATION AND IMAGE SEARCH

INTRODUCTION

Consider where you encounter digital imagery in today's world – coffee shops now doubling as computer lounges, the camera phones we carry with us 24/7, widespread Internet access nearly everywhere you go – these are just a few examples of what is driving the proliferation of digital images. In this cyber-culture, digital images are an effective means of communication and expression. And, with the growing ease of capturing, uploading, and editing digital images, consumers are rapidly becoming *prosumers* — producing their own content as well as consuming others.



The combination of access and tools enables digital images to travel far and fast, and appear in many versions, and in numerous contexts. From iPhone through Photoshop to Flickr and Facebook and on to Google Images, a single digital photo may be uploaded, dispersed, viewed, downloaded, modified, and repurposed with breathtaking speed. And, new services, such as Posterous, have emerged allowing users to send images via email while simultaneously posting on multiple web and social networking sites.

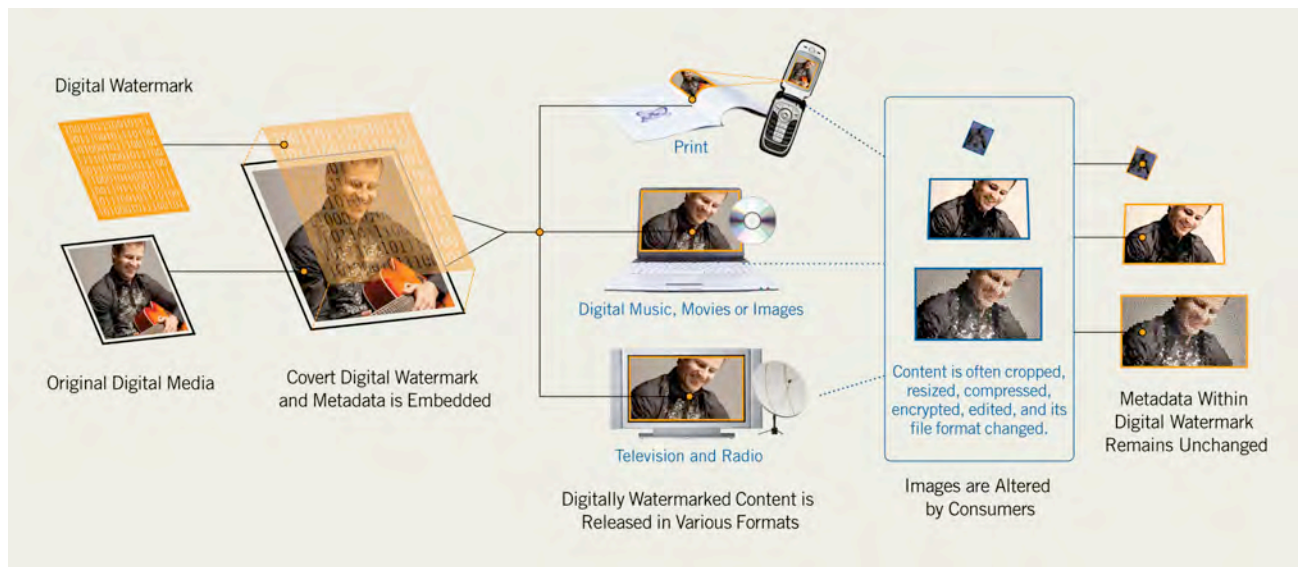
The same is true in the corporate world — images are traveling widely, rapidly, and in multiple manifestations through email and across the Internet. But unlike consumer-generated imagery, businesses continually attempt to control the distribution of their image assets, usually ending up in failure. For the most part, image owners have little visibility into exactly where, when, and how their assets are being used.

Even within their own domains, corporate communications professionals face significant challenges in managing digital assets throughout very complex sales and marketing channels. Images used in new product releases, for example, are distributed to multiple remote offices, agencies, distributors, dealers, and so on. An image may be customized for different venues, such as a corporate web site, product catalogs and dealer advertisements, and its use is critically dependent on timing. Ensuring that the right image appears at the right time in the right place is a major concern.

Finally, the inability to control the use of digital images can be costly. The premature release of launch materials can be devastating — consider the secrecy surrounding the introduction of a new car, for example. Conversely, continuing to publish outdated product images can also lead to lost revenue. An image used without authorization or attribution is often a lost revenue opportunity. In addition to violation of copyright, the unauthorized use of images “in the wild” leaves potential buyers with no way to obtain more information on an eye-catching image or locate the owner to purchase it.

DIGITAL WATERMARKING

Digital watermarking is the process of embedding a persistent digital identity into images to provide the means for effective management and tracking of digital assets on the web. A digital watermark contains imperceptible digital information, also called its *payload*, which can include anything the owner chooses. Digital watermarks persist as the image travels and is transformed, and can be read at any point to determine the image’s unique identity. Watermarks also survive many manipulations that images are subject to: cropping, resizing, compression, encryption and decryption, and conversions of file types.





Persistent watermarks ensure that images remain connected to their *metadata* — information about the image. Metadata can be anything, but it typically includes ownership, copyright, and contact information. So a digitally watermarked image essentially remains attached to its copyright information and other metadata everywhere it travels.

COPYRIGHT COMMUNICATION

Digital watermarking technology is sufficiently reliable and robust that it can provide the legal basis for proving ownership of an image. A watermarked image found outside its expected channels can be identified and copyrights can be legally asserted. The experience of Corbis, a leading stock photography agency, is that claims of ownership based on watermarking consistently stand up in court. In addition to Corbis, Microsoft, Time/LIFE, Paramount, and many others protect their image assets with digital watermarking.

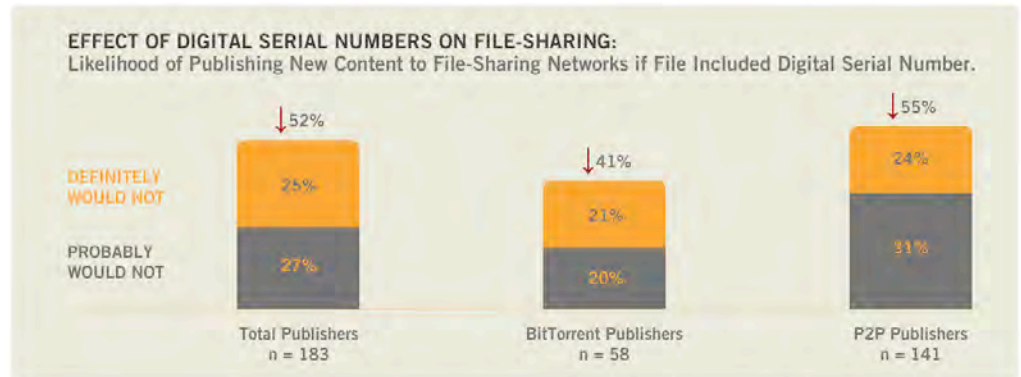
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However, watermarking has value beyond simply issuing takedown notices for unauthorized use of images. Asserting ownership may be just the first step in negotiating image uses that benefit owner and consumer alike. For example, discovery of a watermarked image could easily trigger an automated, online licensing application that permits the user to view the usage rights and immediately license it.

The screenshot shows a web application interface for licensing content. At the top right, there are links for [support](#), [contact us](#), and [log in](#). Below these is a link to [Register for a new account!](#). A grey bar labeled "Current Store" is visible. The main content area is titled "License Content" and is divided into two sections: "Royalty Free License" and "Request License". Under "Royalty Free License", there is a dropdown menu for "Royalty Free Usage:" with options: Super High Resolution, High Resolution, Medium Resolution (selected), Low Resolution, and Web Resolution. Below this is a "Build License" section with input fields for "License Start Date:" (8/14/2009), "License Code:" (|LSRF|V0100|U001|1IAA1UNA2RFM|), and "License Fee: *" (\$ 200.00). At the bottom of this section are "Start Over" and "Build License" buttons. To the right, a "Content Details" sidebar shows a thumbnail of a pool, the filename "PalmSpringsPool.jpg", the title "Palm Springs Pool", and metadata: Provider: Owner Info, Copyright: 2009, Content Type: Image, License Type: Royalty Free, and a link for [Larger Preview](#).



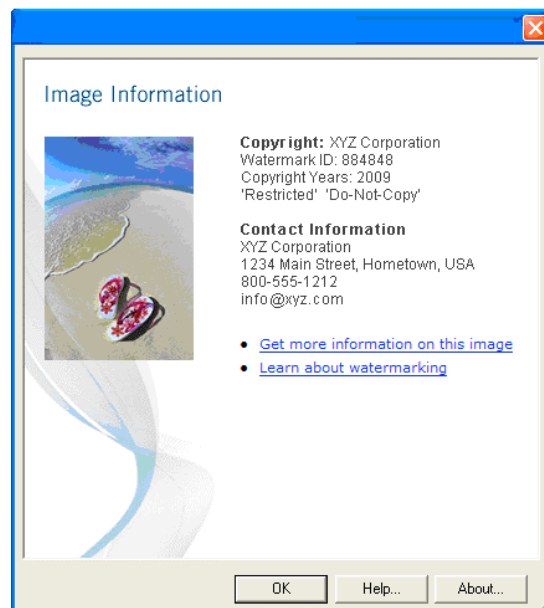
The watermarking of images can also serve as a deterrent to piracy and unauthorized use. A survey recently completed on behalf of the **Digital Watermarking Alliance** strongly suggests that users who illegally download or share digital audio or video content online would be significantly less likely to acquire or share content illegally if they knew the content contained a *digital serial number* — that is, a watermark. While the survey polled users of audio and video content, it is likely that users of still images share those attitudes.



The Digital Watermarking Alliance commissioned the survey, **Consumer Strategies for Detering Illegal File-Sharing Using Digital Serial Numbers**, in 2009. The white paper, **Digital Serial Numbers and Piracy Deterrence**, reports on the survey findings and is available for download on the Digital Watermarking Alliance site: www.digitlwatermarkingalliance.org.

IMAGE IDENTIFICATION

To identify watermarked images online requires a combination of digital watermark readers and image crawlers. Readers can be deployed at critical points in an organization's own workflow and are available



in the form of a browser plug-in, application plug-in or other software application. An image-crawler is a program that continually traverses the Internet searching for watermarked images and reporting on its finds.

In some situations, very sensitive images may appear when or where they shouldn't — before a new product release, for example, or in public rather than strictly private channels. In such cases, watermarks provide forensic value. Since watermarks can be used to distinguish individual copies of an image, it can determine, with certainty, which original

copy of an image was leaked before release or into public view. This capability has value for both indemnification and deterrence.



Readers deployed within an organization can monitor sales and marketing distribution channels, identify specific instances of images, and report on images found outside of authorized use. Judiciously placed readers play a significant role in an internal image-tracking service that helps ensure that the right image appears in the right place, at the right time.

Readers can also be deployed on the Internet in agreement with image aggregators, including social networks and photo sharing sites. In this case, readers can identify watermarked images and take some predetermined action including blocking or filtering based on their usage rights or restrictions. For instance, a person copies an image found on a popular media site – say *The New York Times* – and tries to upload it to his/her Flickr account. The watermark could block the upload and communicate that the image is copyrighted. Other actions include less restrictive approaches such as pairing targeted advertising with the display of an image or providing links to additional images by the same image creator.

Simply tracking digital assets on the web can be beneficial even without acting on unauthorized uses. Valuable marketing information to brand managers and alike is gained by knowing where imagery is being viewed in the wild, outside authorized or tracked channels of distribution.

CONCLUSION

Digital images are increasingly valuable for communication, expression, and branding in an environment of widespread Internet use. But the ease of uploading, downloading, and modifying images has made controlling digital assets more and more challenging, and loss of control of these assets can be very costly. Not knowing where, when, how, and by whom digital assets are being used can mean direct and indirect revenue losses for image and brand owners.

Digital watermarking is a proven, readily available, and cost-effective solution to the problems of better management of digital image assets and better tracking of unauthorized uses of images on the web. Watermarks do not interfere with the enjoyment of an image by its intended audience. They support a variety of flexible options for communicating copyright and asserting ownership, including automated take-down notices, immediate image licensing, and more indirect methods of monetization such as associating ads or link-backs with copyrighted images.

Digital watermarks can also be used within an organization to implement an effective image management system. In the context of complex sales and marketing channels, multiple offices, agencies, and dealers, ensuring the appropriate use of images is challenging. But it is critically important to use the right image in the right place at the right time with the right authorization — an image released too early in a product launch could negatively impact a brand, neutralize a competitive advantage, and adversely affect revenue. Digital watermarking can easily be integrated with a Content Management or Digital Asset Management system to help ensure the timely and proper use of important digital assets.

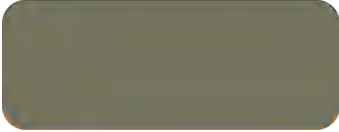


Image identification and copyright communication is just one of many applications enabled by digital watermarking. Among the others are linking print media to the web, authenticating content, broadcast monitoring, forensic tracking, and piracy deterrence. For more information on the many uses of digital watermarking, visit the *Digital Watermarking Alliance* web site at www.digitalwatermarkingalliance.org.