

# **new media**

where to from here?

---

This paper prepared by **Peter Ikladios**

**April 2008**

---

## ACKNOWLEDGEMENTS

Thanks go to Don Waskiewicz of Deep Blue Insights for providing insights into the list broker industry, where it was, where it is and where it's going.

And a Special Thanks to Associate Professor Mary Tripsas of Harvard Business School, for providing me with the opportunity to reflect and study innovation.

## CONTENTS

<b><u>INTRODUCTION .....</u></b>	<b><u>1</u></b>
THE EVOLUTION OF MEDIA .....	1
LAYOUT OF THIS DOCUMENT .....	1
DEFINITIONS OF NEW MEDIA.....	1
<b><u>CURRENT ECOSYSTEM AND PLAYERS .....</u></b>	<b><u>3</u></b>
<b><u>EVOLVING PRINCIPLES .....</u></b>	<b><u>5</u></b>
PRINCIPLE 1: NUMERICAL REPRESENTATION .....	5
PRINCIPLE 2: MODULARITY .....	7
PRINCIPLE 3: AUTOMATION.....	10
PRINCIPLE 4: VARIABILITY .....	12
PRINCIPLE 5: TRANSCODING .....	14
PRINCIPLE 6: DISPERSAL .....	16
PRINCIPLE 7: USER-SPECIFIED ORGANISATION .....	18
<b><u>EMERGING TRENDS.....</u></b>	<b><u>20</u></b>
<b><u>CONCLUSIONS.....</u></b>	<b><u>22</u></b>
<b><u>REFERENCES.....</u></b>	<b><u>23</u></b>

## INTRODUCTION

### THE EVOLUTION OF MEDIA

From the earliest cave paintings, to songs handed down through generations, various forms of media have allowed civilisations to communicate among individuals and between groups of people. Over the centuries and through advancements such as the printing press and radio, media became accessible to more and more people.[1]

Today, the internet is one of the most pervasive communication technologies in the world. Its unique ability to allow communication both to and from a user and facilitate a non-hierarchical information structure, has allowed it to become a key enabler for the “New Media” evolution.[2]

This paper aims to ascertain the current state of the new media industry, highlight where there are opportunities for innovation and indicate the potential players in this space.

### LAYOUT OF THIS DOCUMENT

This document is structured in three key sections.

- The first section, **Current Ecosystem and Players**, maps the current New Media ecosystem, identifying the sectors involved and their relationships.
- The second section, **Evolving Principles**, focuses on the seven principles of new media and identifies organic evolution in each area. This essentially provides a bottom-up analysis of evolution in the new media industry. For each principle, a snapshot of where the industry currently stands and what opportunities exist within each is documented.
- The third section, **Emerging Trends**, attempts to bring all these elements together and highlight overarching trends and as a result, pinpoint other areas of innovation. It provides a top-down analysis of this same evolution.

### DEFINITIONS OF NEW MEDIA

Although the term “new media” is widely used, there is still ambiguity around its definition. Currently, there is no agreed definition of “new media” and what differentiates “new media” from “old media”.[3] As such, an attempt is made here to define “new media”. Based on this, the current ecosystem is modelled and bottom-up innovation can be foreseen.

Manovich[4] defines five principles for “new media”. These are Numerical Representation, Modularity, Automation, Variability and Transcoding.[5] He further specifies that not every new media “object” needs to have all these characteristics, but rather that these are growing “general tendencies” within the global culture of computerisation.[6]

Lister[7], on the other hand, proposes a different set of guiding principles for “new media”. These are Digitality, Interactivity, Hypertextuality, Dispersal and Virtuality.[8] Based on Lister’s explanation of these terms, all these definitions could fall within Manovich’s principles, with the exception of dispersal. As such, Dispersal could be added to Manovich’s principles.

The final principle which I propose that is not mentioned by current “new media” writers, but implied through the characteristics of current “new media” practices is that of User-specified organisation.

As such, the seven basic principles of “new media” that will be covered in this document are:

1. Numerical Representation
2. Modularity
3. Automation
4. Variability
5. Transcoding
6. Dispersal
7. User-specified Organisation

As already mentioned by Manovich, these principles are not meant to be “binding” but rather provide a general indication of where this media-type is heading. [6]

## CURRENT ECOSYSTEM AND PLAYERS

The diagram on the following page provides a depiction of the current sectors within the New Media industry. It has elements derived from the diagram of the emerging media ecosystem put forward by Bowman and Willis[9]. Their ecosystem focuses on mainstream and citizen media from a news-reporting perspective. However, many elements they specify are relevant in the overall new media environment.

The diagram attempts to identify relationships between these different sectors and those that have existed in both traditional media and new media, as opposed to those which only appear within the New Media sector.

Definitions for each of the sectors are as follows:

**Technology Providers** are those companies which develop hardware and software technologies which are utilised within the solutions. Their focus is to develop the required knowledge of technology and the corresponding components that make up the end solution. Typically, these include players such as Sony, Microsoft, Nokia, Sony-Ericsson, Samsung, Phillips, HP and Adobe, among others.

**Delivery Services** cover the span of companies that provide the “last mile” access to media for the end-user. These companies generally have a direct relationship with the customer and provide access to services. Companies included in this space, are typically Internet Service Providers (ISPs), Cable/Pay TV providers and telecommunication carriers. Within this space, we could also see cinemas and free-to-air television and radio broadcasters.

**Retailers & Stores** covers all the real-world and online stores that users would purchase from.

**Content Facilitators** broadly covers the companies that provide online services that provide easy access or grouping of content. They facilitate the retrieval of media by users. Search engines (such as Google), portals (such as Yahoo), content sharing sites (such as YouTube) and information communities (such as Last.fm) all fall within this category. Their role in the customer value proposition is to provide easy access to media that a user wants.

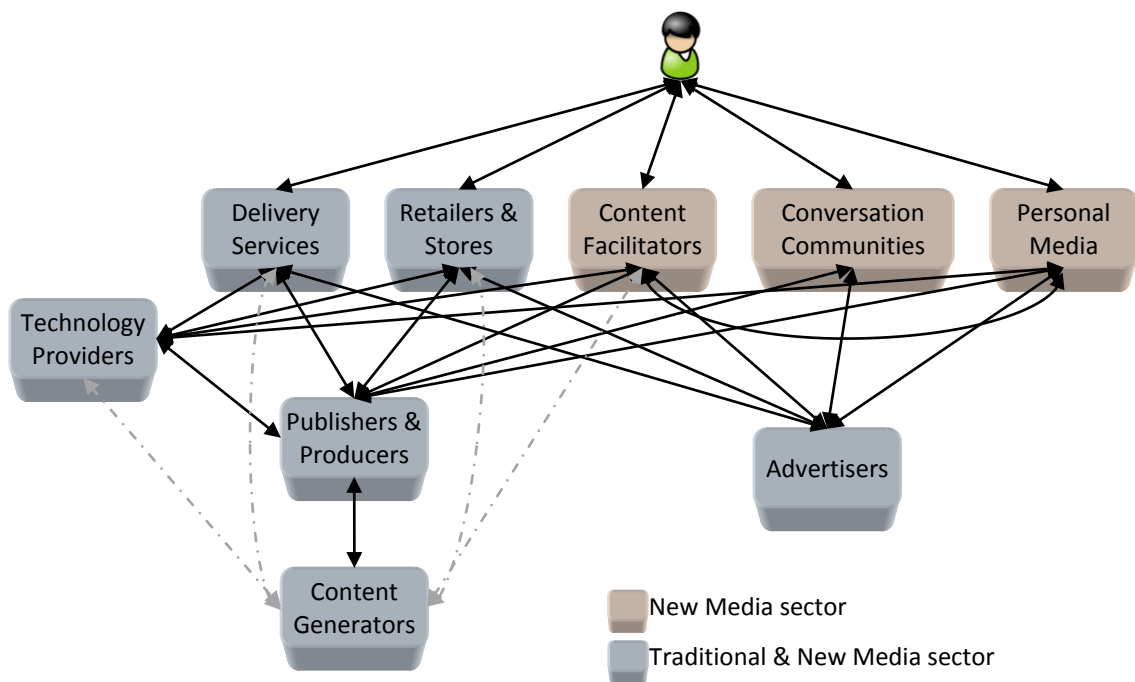
**Conversation Communities** covers the companies that provide online services to facilitate conversations between users. The role these sites play is to allow a user to receive greater understanding about a particular product, issue or service from the wider internet community. These companies include article-voting sites (such as Digg), community information sites (such as Wikipedia) and product review sites.

**Personal Media** covers the companies that provide blogging and social networking sites (such as Blogger, MySpace or Facebook). Their current role is to allow users “publish themselves” on the internet.

**Publishers & Producers** covers the companies that will generally finance, produce and distribute professionally-created content. Within the traditional media space, they are the film studios, recording industry and print publishers. Their role has evolved to factor in electronic distribution of the same content.

**Content Generators** are the spread of organisations and people that professionally create content. Typically, this could include reporters, authors, games writers and musicians.

**Advertisers** cover the companies associated with creating advertising campaigns.



## EVOLVING PRINCIPLES

### PRINCIPLE 1: NUMERICAL REPRESENTATION

The principle of Numerical Representation is that the media is converted into a numerical format.[6] Digitising is the most common type of conversion for media, which renders media within a “binary” domain. Binary is the notation that is used by all digital technologies, including computers and the Internet.

This is a fundamental principle that all other principles rely on. When media is digitised, it allows the media to be stored, transmitted and adapted for individual users.

#### CURRENT STATE

At the moment, when most media is captured or produced, it is already stored in digital format, from digital photos and digital videos to text documents. Most music and movies are created in digital format and a significant proportion are also distributed in digital format, through technologies such as the Internet (eg: iTunes), DVDs and CDs. Text-based media, such as books are also predominantly created in a digital format (with word processors, such as Microsoft Word), but distribution, at the moment, remains predominantly in paper, non-digital, forms. There is an on-going initiative that attempts to distribute books digitally, to consumers, but this is yet to take off.

#### OPPORTUNITIES AND THREATS

Continued growth associated with this principle is generally around the digital distribution of media rather than in its production. Most media generated today is already encoded in digital format, so there is no significant growth expected in creation.

One other area that is still in its infancy is intelligent content encoding. This is where a computer (or server) is able to not only digitally encode the content but also “understand” the content. Having this content “understood” by machines allows for some of the remaining principles such as *automation*, *variability* and *user-specified organisation*.

Some examples of the evolving form of computers understanding content are:

- Photos containing the names of the people found in the photo. The computer would be able to identify the people automatically. Facebook have implemented a mechanism to identify people within photos. Hence, it is possible to search for photos of people [10]. However, this still requires a person to tag the image with a list of names of people contained in the photo.
- Photos containing the names of specific landmarks found in the photo, after the computer had analysed and identified those landmarks. Microsoft are developing a technology which is able to model a set of pictures into a 3D model of a particular landmark or scenery [11].
- Music containing the text lyrics of the song. For this to be automatically possible, technology will need to evolve significantly.
- Videos containing the names of all the people who are in the video. In a similar way to photos, Facebook have implemented a mechanism to identify people within videos, making it possible to search for videos of people [12].

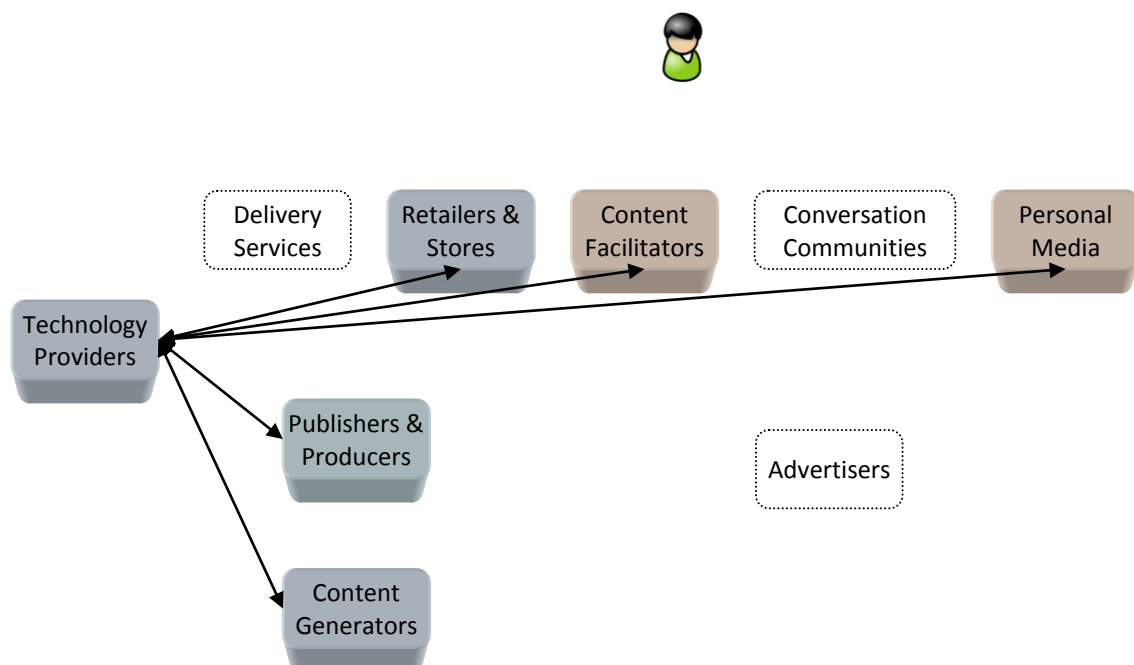
Once a computer or server “understands” the content, it will need to add this additional information to the media item. This extra information is known as metadata.[13] This is seen quite commonly today in digital cameras, which are able to provide the extra details of the photo, such as date, time, light settings, location (if the camera is GPS enabled). Online, the concept of “tagging” content is quite prevalent. This is where users are able to assign this extra information to the content.

It is anticipated that as technology advances, this analysis would be automatic and seamless to the user. At the moment, much of this intelligence is manual, in that it requires a person to enter the extra information. As technology evolves, computers will be able to automatically recognise this information within the content and extract the relevant parts.

The threats to this being successful are the following:

- Technology has not advanced far enough to allow for intelligent analysis of content. With ongoing hardware improvement, through paradigms such as Moore’s Law [14], hardware will be able to perform the highly complex computations required to perform this analysis in short durations of time. Till hardware performance catches up, large clusters of computers will be needed to perform these computations.
- The issue of privacy on the Internet has recently become more prevalent. This kind of automatic analysis will require stricter controls around privacy. Furthermore, as a result of the perceived threat of identity theft, more users will prefer to restrict their privacy settings, thus making this technology redundant.

## THE PLAYERS



Within the digitising of content, most content producers are already within this space. Specifically, within the lagging books space, the following players currently exist:

**Google** – Google is in the process of digitising a large number of books used by universities. According to Larry Page, Google co-founder and president of products, Google’s vision is to make “the incredible breadth of information that librarians so lovingly organize searchable online.”[15] Google have the opportunity to extend this into the consumer books space. This would require the development of an “eBook” ecosystem, which is currently quite limited. Hence, if the eBook products do become quite common, Google would be in a prime position to capitalise on its digitised collection of books.

**Amazon** – Amazon, having recently launched their Kindle device, have started to take an active role in pushing the eBooks concept.[16] Amazon are in the enviable position of having a massive portfolio of books in their catalogue, being one of the most recognised online brands[17] and having a customer base exceeding 30 million[18]. In any case, if the eBooks concept does not fly, Amazon will still have its online book and other media sales, which make up over 60% of their revenue[19].

**Sony** – Similar to Amazon, Sony have also launched their portable eBook reader device and online store, to push the eBooks concept.[20] Sony’s expertise with consumer devices and usability also puts them in a strong position to establish a strong following.

Overall, although the technology is reasonably mature, the eBooks space is still in its infancy and its growth remains questionable.

On the other hand, in the field of intelligent digital encoding, there is still much progress to be made. Much of the metadata and tagging is either “simple” data (eg: date, time, GPS co-ordinates) or specified by other users. The following are seen as the players here:

**Google and Microsoft** – Microsoft and Google’s Image Search is based on indexing images and tagging them by looking at the content on the page around the image. Hence, a form of intelligence exists, in which the information is deduced from other text content. Microsoft and Google could enhance their image search by utilising technology to perform this analysis. As the technology is still in its infancy, it would be expected that rather than implement it themselves, Microsoft and/or Google would acquire a company with the technology. In August 2006, Google purchased Neven Vision, a company building technology for facial recognition.[21]

**Yahoo** – Through Yahoo’s Flickr photo-sharing site, Yahoo’s driver would be the same as those for Google’s Image Search. In the same way, it could be expected that once the technology has matured, Yahoo would obtain image recognition technology through acquisitions.

**Audio and Image Technology Vendors**, such as **Riya** and **Gracenote** – These vendors will continue to evolve their technologies, improving accuracy and speed. Once they achieve a level of performance that satisfies consumers, their technologies will probably be integrated within other content facilitator sites, such as search engines and content sharing sites. There is probably a high likelihood that they may be purchased by one of the larger content facilitators, as it would also provide a valuable new way to browse and/or search.

## PRINCIPLE 2: MODULARITY

The principle of modularity prescribes that each element within the new media eco-system is a modular block. These modular blocks can be used interchangeably, thus allowing a more tailored experience for the user. Moreover, it allows web site developers to develop sites and services for users that use products and services provided by other providers.[22]

When accessing a new media resource via the Internet, users will typically run through the following phases (Adapted from [23] and [24]):

1. **Browsing/Searching** – The initial discovery of the media item.

2. **Authentication** – The verification that the user is who they claim to be.
3. **Authorisation** – The confirmation that the user is allowed to access that media item.
4. **Payment** – Where necessary, the system for charging a user, before allowing access to the media item.
5. **Access** – The actual access of the media item.
6. **Accounting** – The storage of information about the transaction, for historical and reporting purposes.

While some of these phases are optional, each one can be seen as a modular element that could be provided by different parties.

---

## CURRENT STATE

Currently, many of the phases indicated above are provided as modular services on the internet. These are described as follows.

Within **Browsing & Searching**, various sites provide search and directory facilities for users. Once a user has found what they are looking for, they click on that link to take them to the required resource. The development of widgets and social-networking applications has increased the modularity aspects of this phase. It allows a provider to produce a modular component that facilitates the browsing and searching of content. Some commercial relationships exist between the search/directory service and the content provider.

For **Authentication**, many sites provide their own system of authentication, which requires a user to have many different user-ids and passwords for each of the sites. Over the past few years, a new initiative has been gaining momentum known as OpenID. The OpenID foundation was recently formed to create a single-sign-on for the plethora of web services currently available[25]. It aims to unify all user authentication mechanisms on the internet, so that users will only need to know one username and password. This would therefore extend modularity into the Authentication spectrum.

For **Authorisation**, the site that provides the resource is also managing the Authorisation process.

For **Payment**, there are many third parties that manage Payment, such as Verisign, Google and PayPal. They provide an open interface into which a provider may access, to ensure correct charging of their customers via a variety of payment options. Commercial relationships exist between the payment gateway and the content provider, typically with the payment gateway taking a commission for each transaction.

Within **Access**, typically a provider will source the content from their own site. However, even this content is currently being made more accessible, via modularity. RSS feeds are provided which allow content providers to push their content out to other parties sites or services. Furthermore, some content providers are developing sets of widgets and/or social-networking-applications. These widgets and applications typically contain a subset of content and a link back to the main site. They can be inserted onto user's portal pages, or within their profile pages on social networking sites. Generally, no commercial relationship exists between the content provider and those using the modular elements of the content.

For **Accounting**, typically the site that is providing the access or resource is also recording their own information about the transaction and the user. This information is not normally provided to outside parties. Some companies, though, do sell this information to list brokers.

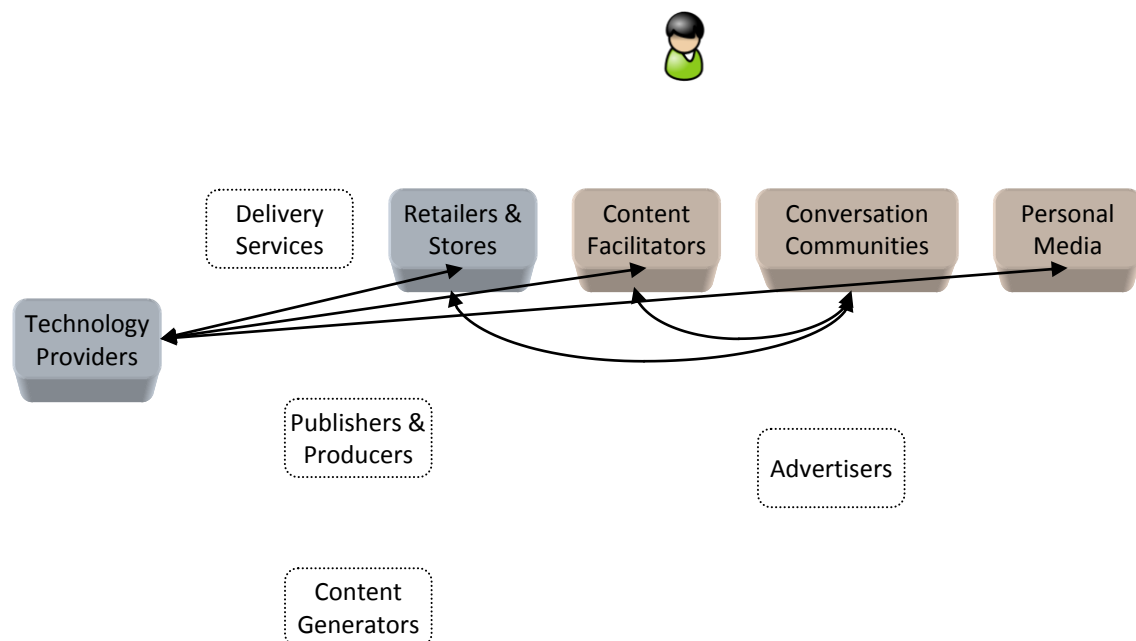
## OPPORTUNITIES AND THREATS

As can be noted from the above analysis of the current state, there is no modularity within the Authorisation nor Accounting phases of a transaction. Authorisation is highly related to the content being provided and as such, I do not anticipate much progress in this area of modularity.

However, for Accounting, there are several opportunities where a content provider may sell information about transactions or demographic groups for the purpose of advertising or for recommendation engines. This information, in turn, is fed back into the Browsing/Searching phases to provide more relevant content for users, based on their past behaviour. This occurs, to a limited amount, at the moment, and relates to the direct marketing and list broker industry[26].

Clearly, there are issues with privacy that need to be addressed. Some are real threats, but there are also perceptions of poor security, that also need to be circumvented by educating users.

## PLAYERS



Evolution within the area of modularity applies to many (if not all) of the user-facing industries as depicted on the diagram above. Furthermore, technology providers will continue to introduce new technologies that enable facets of modularity.

Some of the specific players that are in prime positions are listed below. These are based on increases in modularity that directly affect users within the phases of Authorisation and Accounting and the flow-on back to Browsing/Searching.

As mentioned in the previous section, the **OpenID** foundation exists to unify all user authentication mechanisms on the internet, so that users will only need to know one username and password. Not only does this improve the experience for the end user, but it also facilitates the following two scenarios:

- New web services can integrate with an OpenID authentication system, thus reducing the need to have new users sign in with their details each time.
- It allows for much more coherent data in attempting to understand user behaviour.

The OpenID foundation will continue to increase their breadth (by including more sites that use OpenID for authentication) and their scope (by penetrating more into the other phases of the transaction, namely Access and Accounting).

**Google** operates in several spaces and has shown signs that they are progressing the cause of modularity. Firstly, they have now signed up to the OpenID foundation[27]. Secondly, in the area of Accounting, they are storing users data for up to 18 months on searches history and longer for other services (such as Google Mail or Google Checkout, their payment service)[28]. It appears that Google are continuously expanding their databases to cover more and more user data. This will feed into the third area of Browsing/Searching, where, through this new data, more relevant results and recommendations can be presented to the user. As Google own much of the infrastructure and data, they will be a major player in this space.

**Paypal** and other similar payment providers may look to start commercialising their existing Accounting data from their users' transactions. This will generate alternate revenue streams, beyond just a commission for handling the transactions.

**List compilers**, who traditionally worked in direct marketing scenarios, will continue to attempt to integrate the vast variety of information about users from the internet. As data is provided from the various sources (such as those listed above), these compilers will attempt to merge it into existing datasets. Beyond uses for direct marketing, this data would be valuable in creating dynamic websites that generate recommendations and content, tailored to that particular user[26].

**Facebook, MySpace, Hi-5** and most of the other social networking sites will also attempt to commercialise the user data they have stored. Based on demographic data, and increasingly based on user habits and patterns, they will attempt to create more targeted advertising campaigns. Furthermore, there is an increase in the amount of data that these social networking sites are receiving from other online providers. For example, Facebook launched their Beacon product, which allowed other online sources to register a user's behaviour back to Facebook[29]. Facebook would then publish this information as another "activity" that the user performed. Ultimately this can enhance the targeting of advertising.

Recently, several start-up companies have been developing recommendation systems. Two such companies are **Matchmine**[30] and **Loomia**[31]. These companies develop algorithms and systems to improve the quality of recommendations presented to users. They have recently introduced APIs which allow third parties to interface with their systems[32]. Furthermore, Loomia is providing the recommendation engine component of the Wall Street Journal[31]. As recommendation engines become outsourced, these companies will need to rely further on other sources of data. With the OpenID initiative, the increasing data available from List Compilers and social networking sites, these companies will need to select the right data that can improve conversion rates for their recommendations.

### PRINCIPLE 3: AUTOMATION

The principle of Automation allows for computers and systems to automate tasks associated with media. This could range from something as simple as scaling an image to a user's screen size, through to the more complex task of removing the red-eye from photographs of people.

Automation becomes an important enabler for a "new media" world as it allows content generators to remain focused on generating compelling content, thus leaving the systems to perform the tedious work that is

involved in traditional editing. Furthermore, it becomes an enabler for providing tailored experiences to individual users.

---

## CURRENT STATE

Currently there are many forms of automation implemented on the Internet. These instances vary wildly and are specifically tailored for each particular website-type or industry. Some examples of this automation include:

- Automatic image resizing
- Identifying similar news feeds
- Messaging associated “friends” about a new event you have become aware of

---

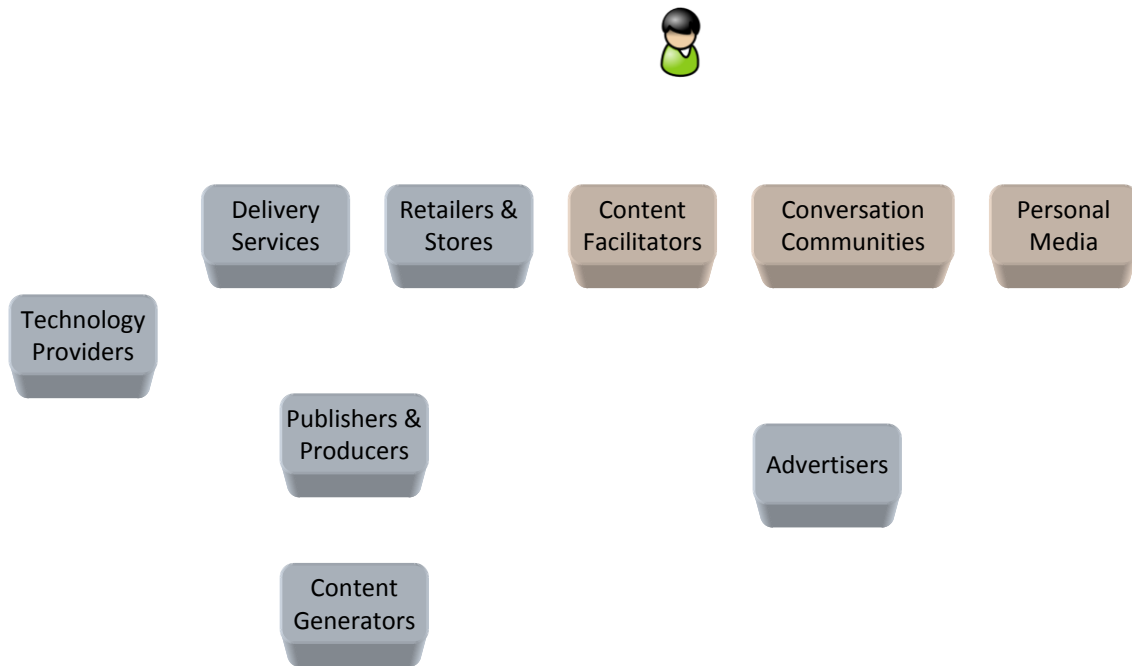
## OPPORTUNITIES AND THREATS

Opportunities around this principle of automation are quite broad. The key is to identify one of two scenarios:

1. A task which an end-user or intermediary must do repeatedly
2. A task, which if automated, could provide significant cost savings for an intermediary or allow new functionality to be implemented for an end user.

It is anticipated that automation will simply be the evolution of each product or service, factoring in user behaviour, improvements in system & network performance and process improvement. Considering the overall innovation cycle, innovation here lies in process improvement, as the technology and industry matures.

## PLAYERS



All new media companies will be involved in automation and so none are singled out.

## PRINCIPLE 4: VARIABILITY

Variability is the ability for a new media object to be rendered differently to different users. This provides end-users with a tailored experience that factors in the user's context. The user's context can include (but is not limited to) the following defining factors:

- From what device the user is accessing the object
- Where the user is currently located
- What the time of day currently is
- What interests does the user have
- What are the user's spending/browsing habits
- What is the user's current "frame-of-mind" – are they searching, filling in free time, actively looking to buy, etc?

In achieving variability, there are two fundamental components necessary. These are:

1. Collecting the information required which influences the variability, and,
2. The algorithm and associated systems that actually vary the media object

The first of these, *information collection*, consists of data collected in real time, as well as the data collection described in the "Accounting" section within the principle of modularity.

## CURRENT STATE

Currently variability is presented in many forms. Each of these forms is based on what information the varying system has about the end user. Obviously, the more information available to it, the higher the capability of variation.

The following are current instances of variability:

Recommendation engines – Generally present on online stores, these engines know the user’s browsing and/or buying habits (at least from their own sites). Based on these, the recommendation engines will propose other products that might be of interest to the user. These are rendered most often with phrases such as “Other people who bought this also bought...” and are tailored based on that user’s experience. These engines will provide a recommendation to the user about where they should go next.

Advertising engines – Similar to recommendation engines, these engines generate a series of ads for presentation to the user, based on their browsing habits and on what the user is currently doing.

## OPPORTUNITIES AND THREATS

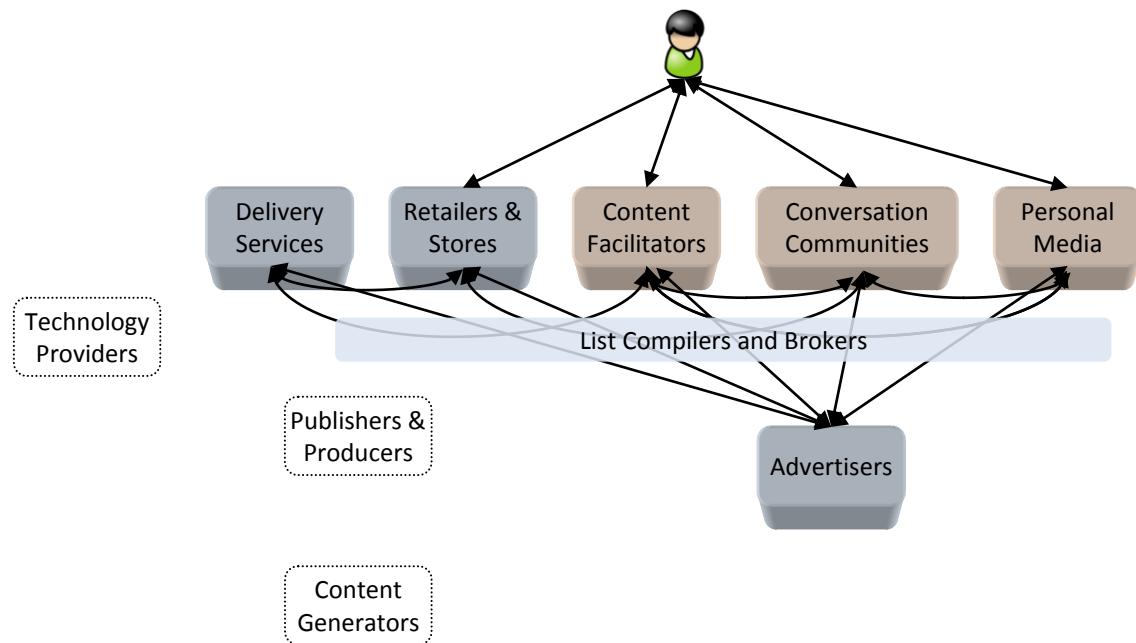
An opportunity exists that affects organisations that use recommendation or advertising engines. To increase the relevance of both recommendations and advertising, this opportunity exists to increase the number of information sources used. Current recommendation engines and ad-serving engines (systems that serve up relevant ads to users, while browsing the web) rely on very basic real time information (eg: current search query that user is typing) and very limited user knowledge (although some search engines do store a user’s search history and use that in determining relevant ads). Recommendation and advertising engines can improve their conversion rates (the rate of users who follow recommendations or ads and complete a successful transaction) by increasing the information which they rely on in determining what to present to end-users.

As modularity increases within the media space, more information about a user will be available, both in real time and historical data. This was detailed in the section on modularity. By leveraging this increase in modularity, organisations that source this information should be able to commercialise this and generate new revenue streams. Organisations that feed off this information should expect to see increases in their conversion rates.

To facilitate this, list compilers are ideally placed, as they already have relationships with organisations which sell information. Furthermore, they already have experience in managing vast amounts of user data, obtained from a variety of sources.

As detailed in threats in the principle of Modularity, the issue of privacy also becomes an issue here.

## PLAYERS



**Amazon**, over the years, has built a very powerful recommendation engine and stored much data about user's browsing and shopping habits. They have the opportunity to license their technology and/or data. There are several emerging competitors in the area of recommendation engine, so Amazon will be quite active in resisting this new competition.

Other **Online stores & auction houses**, such as **eBay**, will be looking to enhance their recommendation engines to improve their own conversion rates. With increases in modularity and new data providers (such as list compilers and social networking sites), these sites will be looking for the competitive edge against incumbents such as Amazon.

Ad-serving companies, such as **Adwords** and **DoubleClick**, also have much to benefit in a similar vein to those sites that rely on recommendation engines. These companies are looking to improve their conversion rates and will be looking to alternate sources of data to improve their targeting of their advertisement campaigns.

## PRINCIPLE 5: TRANSCODING

The principle of Transcoding allows a new media object to be re-rendered to cater for the device that the user is accessing it with. This enhances the user's experience of new media and ensures that quality remains paramount.

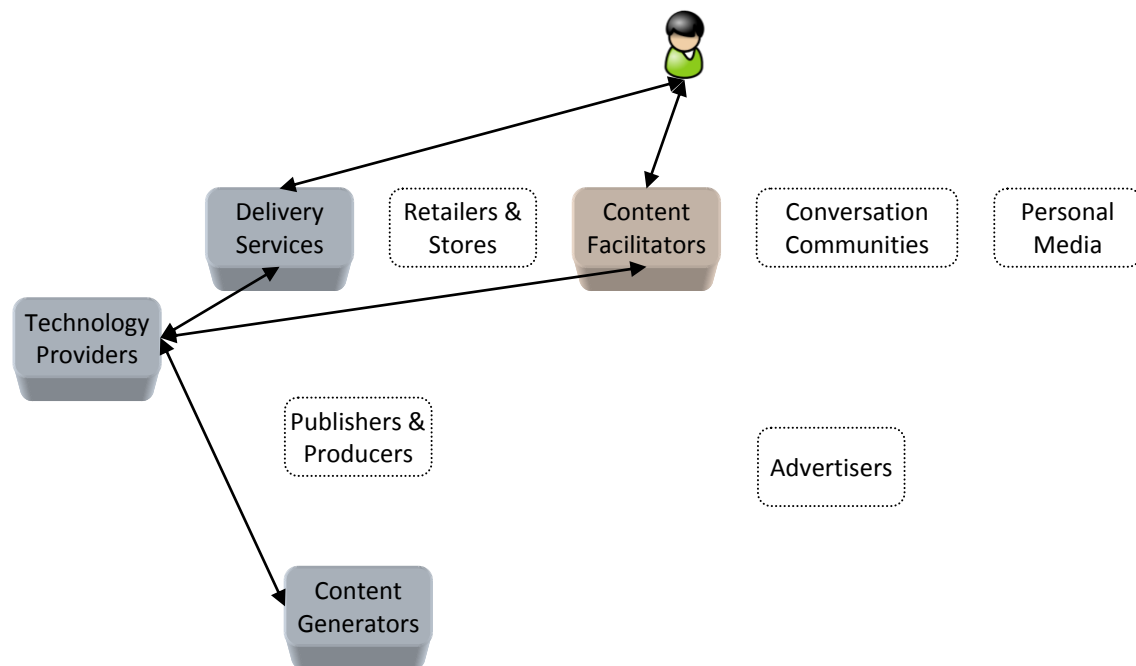
## CURRENT STATE

Picture and Video sharing sites currently provide the ability to vary the content to suit the user's display device. For example, YouTube allows users to watch YouTube videos on their mobile phones – this is the result of the YouTube site varying the content's video format and size[33]. The same is also done by Flickr for photographs[34].

## OPPORTUNITIES AND THREATS

An opportunity involves increasing the number of user devices supported via media transcoding. This should allow for the same content to be rendered on mobile devices, set-top boxes, games machines and even internet appliances. The reason for this is to increase the penetration of new media interactions in a user's day-to-day life. This opportunity is targeted at organisations that either have a pervasive media theme (eg: news services or user-generated content sites) or at niche providers, that cater for consumer or enterprise mobile solutions.

## PLAYERS



There are several technology providers that deal in transcoding, although they started in very different ways. For example, **SlingMedia** and **Orb Networks** developed technology to transcode audio and video from an internet perspective, while companies such as **Dilithium** and **RadVision** developed transcoding from a telecommunications perspective. Although they have developed in parallel with different solutions, their technology could be licensed to other companies that require transcoding technology. This could include hardware vendors who manufacture set-top boxes or home network storage devices, through to online providers who need to provide audio/video in a variety of formats. There is already evidence that Orb Networks[35] and Dilithium[36] are making their technology available for licence.

Online video sharing sites, such as **YouTube** and **Flickr**, will be looking to expand their market beyond the standard computer market. As such, they will be attempting to target set-top boxes, as well as wireless devices. To achieve this, they will need to transcode their content to support these new types of devices and their available bandwidth. The technology could be developed in-house, but it is more likely that they will procure the technology from one of the existing technology providers above.

Online television sites, such as **Hulu** and **Joost**[37], may also be looking to expand their market beyond the computer scene. At the moment, the networks that support these services (such as CBS, Fox, NBC) are engaging in individual license agreements with wireless carriers to deliver their services to wireless

devices[38]. Over time, we will see them providing more content through alternate delivery mechanisms. Once again, this will necessitate transcoding and as such, they will require technology providers to source this technology. It is expected that the TiVo model will become standard, but using IP technology for delivery to create more of an on-demand service for users[39].

## PRINCIPLE 6: DISPERSAL

The principle of Dispersal, is, as the name suggests, the principle that a new media object becomes accessible to all people. Achieving this principle implies:

1. That the user is technological covered to receive the content
2. That no censorship or government regulation prohibits the item from being presented. (Obviously, where an item is illegal, authorities are within their power to block that item).
3. That no industry or organisational policy exists that prevents the item from being presented

As the internet is quite pervasive and is typically the transport medium for most new media, metrics for the Dispersal principle of New Media can be directly correlated to the reach of the internet.

## CURRENT STATE

Internet usage, worldwide, has reached 1.3 billion people. In the period from 2000-2007, this was an increase of 266%, with the largest growth areas being Africa, the Middle East and Latin America. Concurrently, mobile phone networks cover approximately 50% of the population, with continued growth expected[40].

IPv6, the successor to IPv4 (the current technology that enables the internet) is currently being rolled out across the world. It allows many billions more IP addresses (and therefore, Internet-connected devices) than IPv4. The expectation is that each person will be assigned a range of IP addresses that they can assign to the various internet-connected devices they own. The implication is that people will be connected to the internet by far more means.

## OPPORTUNITIES AND THREATS

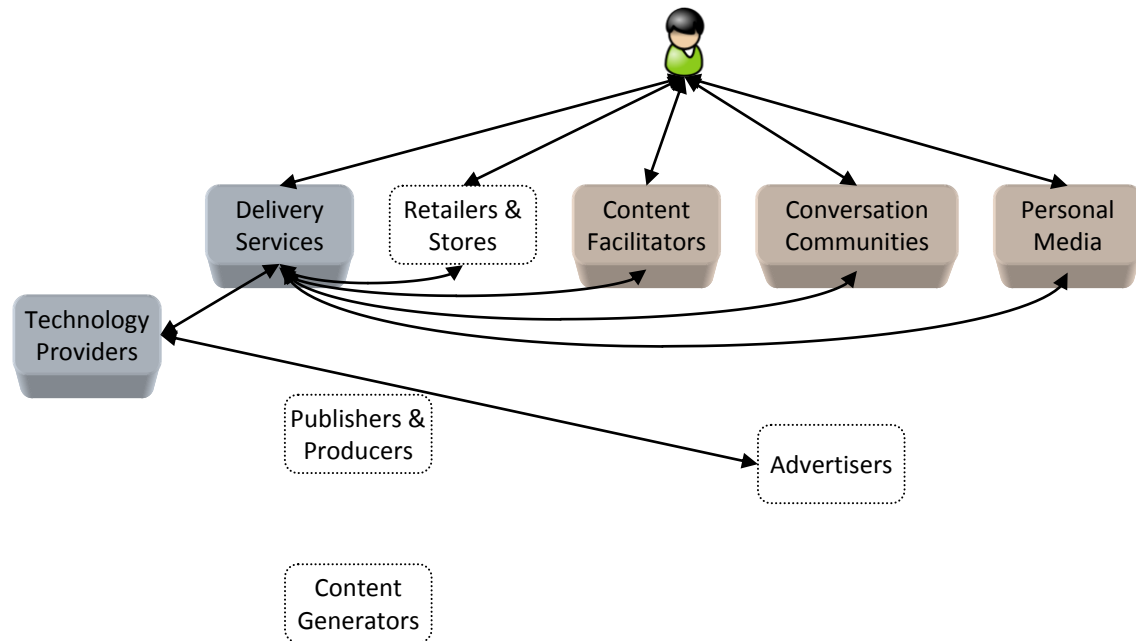
As internet coverage continues to grow, internet provision will become a commodity. This is already witnessed in several geographies.

There is an ongoing threat that governments may attempt to impose restrictions on media published on the Internet. This has already occurred in China and Pakistan (with Google)[41] and in Syria (with Facebook)[42].

The key opportunity here for any form of new media provider, is to ensure their architectures are scalable in three dimensions:

- To allow growth into new geographies (implying localisations for language and cultures)
- To allow growth over varying bandwidths
- To allow growth over varying devices and device characteristics (such as screen resolutions, input methods, sound capabilities)

## PLAYERS



The key players anticipated are the following:

**Internet Service Providers, Cable companies and Mobile carriers** are some of the key players in the area of dispersal. Over the coming years they will be continuing to expand their footprint and increase bandwidth to customers [43]. Due to the large cost inherent with this type of infrastructure, only incumbents are expected and no new significant competition is anticipated.

**Nokia Siemens Networks, Nortel, Ericsson, Huawei, Alcatel-Lucent and Qualcomm**, among others, will continue to be the technology providers to enable increases in reach and bandwidth. Due to the commoditised nature of this particular area, these companies will continue to battle on price and so no new entrants are anticipated in this field.

When the internet was first launched, it was completely unregulated. Over the years, some **Governments** have attempted to develop regulations around the internet. However, due to the distributed nature of the internet, many of these regulations were unenforceable. Nevertheless, some governments ([42],[41]) have successfully blocked certain websites, particularly those which oppose the current government. In an increasing globalised world, it will become increasingly difficult to block particular sites. As such, it is expected that over time, the current attempts to block certain internet sites will disappear.

All organisations and services that provide an online service and have a direct relationship with the customer (in essence, that that are **Content Facilitators, Conversation Communities** and **Personal Media** sites), will need to ensure that they are able to expand into new geographies (if they are not already there), ensure there sites scale for varying amounts of bandwidth available to the user and finally, ensure that their sites work on a multitude of devices, beyond just the computer.

## PRINCIPLE 7: USER-SPECIFIED ORGANISATION

This final principle is the ultimate empowerment of the user. It allows the user to organise or sort through media in the manner that they choose. It is a combination of a user's personal preferences and crowd sourcing. Crowd sourcing relies on the wisdom of the masses, in that many users online can assist in the categorisation of new media elements, rather than these being dictated by the new media producer.

### CURRENT STATE

Currently, users are able to specify the organisation of new media in the following ways:

1. Through search – by specifying a search term they are able to browse, refine and then ultimately find the item they are looking for.
2. Through tagging – by applying “tags” (which are keywords) to a new media item, a user can later search or provide for other users to search based on the tags they specify.
3. Through recommendations – by giving new media items a “vote” for or against the item; certain sites are able to show which new media items come recommended. Examples include digg.com and reddit.com. Also recommendations can be made to friends or “neighbours” on social networking sites.

### OPPORTUNITIES AND THREATS

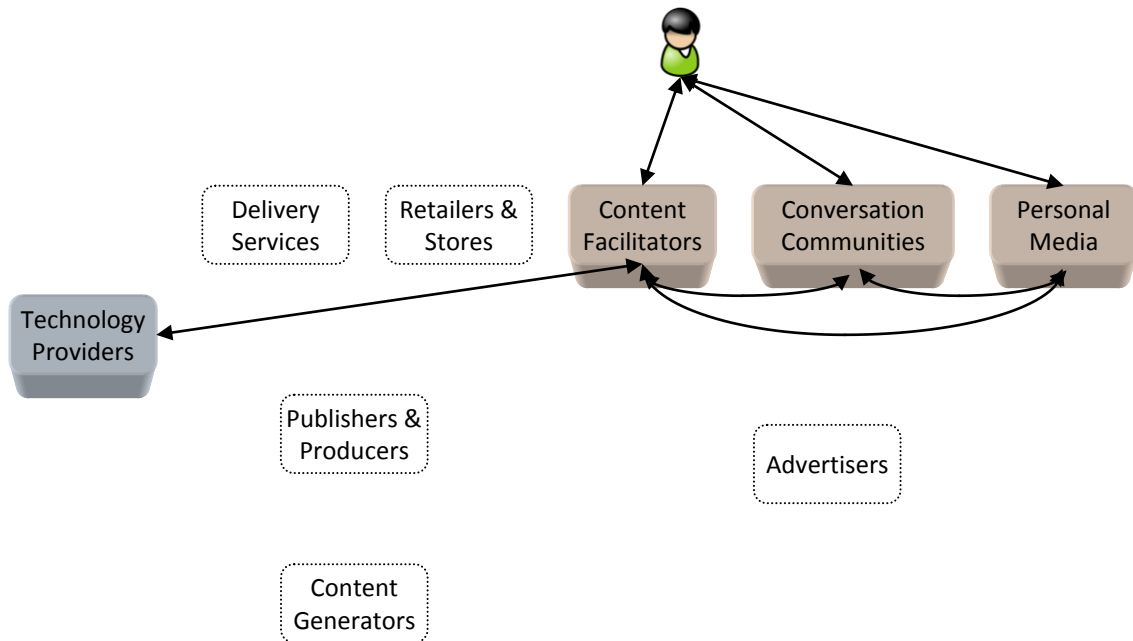
Opportunities exist here through the evolution of user interaction with new media. As users become more educated and technologies evolve, users will increase their reliance on new media in varied aspects of their lives. The key opportunities exist in:

**Enhanced Search** – The current search paradigm has been around now for 10 years and has evolved very little. Enhancing search is a way of easing the ability to find information. Furthermore, enhanced search criteria may factor in more criteria than just the keywords entered by the user, including the user's location, the device they are using, past search criteria, age and even information about their peers.

**More wide-spread adoption of recommendations** – The use of recommendations for most media on the internet will continue to increase. This will consist of voting and tagging for particular media objects. Furthermore, more reliance will be placed on a user's peers to help in determining relevance of media.

**Alternative ways to interact with the internet (beyond PC and mouse)** – Although the GUI and the mouse were designed in the 1970s, they are still the dominant form of human-computer interaction today. Significant amounts of research are underway and already some alternatives have been or are in the process of being commercialised. These include technologies such as T9 messaging on mobile phones (eases the typing of SMS text messages on mobile phone keypads), multi-touch displays (such as on the Apple iPhone, these displays allow a user to use multiple fingers to create gestures that tell the computer what to do) and surface computers (which appear like coffee tables but have built-in intelligence to know what is sitting on them and present information on them about that object). Further research in this field will see the way people interact with computers (and by implication, new media) to be greatly increased.

## PLAYERS



Many of the existing search providers (for example, **Google**, **Yahoo** and **Microsoft**) as well as start-up search providers who are developing new search technologies (for example, **Galaxy-IT**) will be looking to establish new methods of search and improving existing search algorithms. We can expect to see some movement in this field.

Social tagging and voting sites, such as **Digg**, **Technorati**, **YouTube** and **Flickr**, will continue to play a dominant role in assessing new media objects based on the inputs of crowds. There will be an increase in the interactions between personal media sites (such as **Facebook**, **MySpace** and **Hi-5**) and the social tagging and voting sites, with the aim of improving the recommendations that are provided and tailored for individual users.

We can also expect to see Hardware vendors working to innovate and develop alternative forms of human-computer interaction.

## EMERGING TRENDS

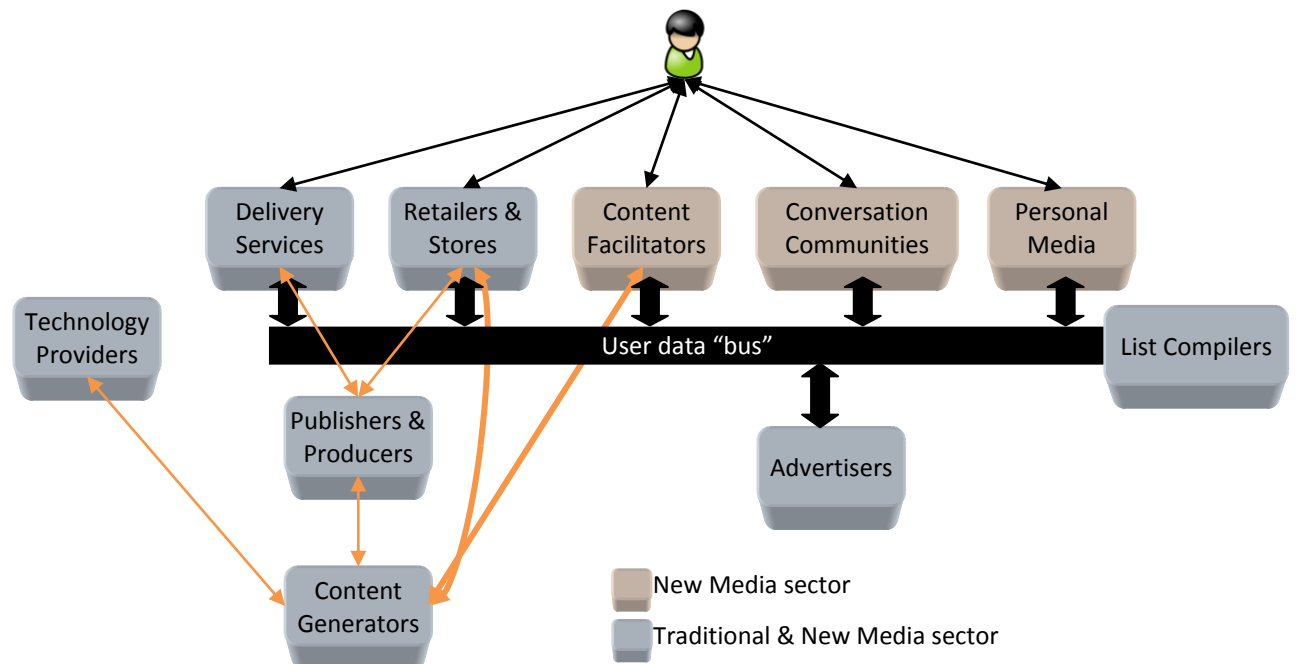
Based on evolution within each of the principles and through observation of general trends within the new media industry, it is possible to identify opportunities and changes to the ecosystem.

Firstly, there are more and more items being categorised as “new media objects”. While some may argue that this is simply a current “buzzword” and is being used in marketing, I would suggest that the *features* that define new media do indeed provide added value to traditional media items. For example, the modular aspects of an online grocery shopping store and the dispersal of internet connections throughout the home, would make an internet-connected fridge useful for re-stocking itself, rather than just a gimmick.

Secondly, with traditional media outlets evolving to new media enterprises (such as print newspaper evolving to online news sites and broadcast television networks distributing TV shows via the internet), end-users are becoming more accustomed to having new media objects form a greater part of their day. As a result, new media will take on more relevance and time in users’ lives.

As a result of these above trends, the ability to present relevant information to users will become increasingly more important. Presenting relevant information to a user relies heavily on the evolution mentioned in the previous sections on variability, dispersal, modularity and user-specified organisation. Beyond the technology and the infrastructure, the most important component will be the data which will help determine the items of relevance for a user. This data will consist of user history, user’s context, user’s peers and information retrieved via crowd-sourcing. As a result, one major trend that will be experienced will be the massive increase in data about users flowing between each of the connected entities. To manage the massive amounts of information, the opportunity exists for list compilers, as they already have experience in collating large amounts of disparate information about users and providing selective information.

The revised ecosystem could look like this:



Companies across the advertising, delivery services, stores, content facilitators and personal media are currently in specific partnerships to share customer data, to ensure more targeted advertising and improved

customer experiences. In some cases they are also selling customer data to list compilers and list brokers. At the moment, this is an ad-hoc system. An opportunity exists to establish a “User data bus” in which the existing proprietary, ad-hoc systems are replaced with open, secure systems. This will facilitate the growing need of user data. Privacy concerns will need to be addressed and the user will need to be put in control of their data, while still ensuring there is enough information to provide the user with relevant recommendations. The company that succeeds to develop this ecosystem will need to invest in interface development, develop relationships with all parties that would utilise the framework and possibly, also regulators.

## CONCLUSIONS

Although the media industry has progressed significantly in evolving to the new media paradigm, it is clear that evolution and innovation will not only continue, but accelerate. The last 15 years has seen the internet and affordable digital technology transform the media space. As fundamental infrastructure matures and users become more educated, the next phase of evolution will see another transformation that will see:

- Higher involvement of a larger base of people
- A higher level of importance being placed on data and how to use it, than on infrastructure and technology enablers.

All organisations will need to adapt to this, otherwise they will be locked in a commodity-market. Instead, they should be developing strategies on how to involve larger audiences and how to capture and commercialise the data they collect.

## REFERENCES

1. Fidler, R.F., *Mediamorphosis : understanding new media*. Journalism and communication for a new century. 1997, Thousand Oaks, Calif.: Pine Forge Press. 16.
2. Kress, G.R. and NetLibrary Inc., *Literacy in the new media age*, in *Literacies*. 2003, Routledge: London. p. 6.
3. *New Media*. 2008 27th February 2008 [cited 2008 4th March 2008]; Available from: [http://en.wikipedia.org/wiki/New\\_media](http://en.wikipedia.org/wiki/New_media).
4. Manovich, L., *The language of new media*. 1st MIT Press pbk. ed. 2002, Cambridge, Mass.: MIT Press. xxxix, 354 p.
5. Manovich, L., *The language of new media*. 2002, MIT Press: Cambridge, Mass. p. 44.
6. Manovich, L., *The language of new media*. 2002, MIT Press: Cambridge, Mass. p. 49.
7. Lister, M., *New media : a critical introduction*. 2003, London ; New York: Routledge. vi, 404 p.
8. Lister, M., *New media : a critical introduction*. 2003, Routledge: London ; New York. p. 13.
9. Bowman, S.W., Chris, *The Emerging Media Ecosystem*. 2005.
10. *Facebook - Photos Help*. [Online help page] 2008 [cited 6th March 2008]; Available from: <http://www.facebook.com/help.php?page=7>.
11. *Microsoft Live Labs: What is Photosynth?* 2008 [cited 6th March 2008]; Available from: <http://labs.live.com/photosynth/whatis/>.
12. *Facebook - Video Help*. 2008 [cited 6th March 2008]; Available from: <http://www.facebook.com/help.php?page=26>.
13. Veltman, K.H., *Understanding new media : augmented knowledge & culture*. 2006, University of Calgary Press: Calgary. p. 253.
14. *Moore's Law - Wikipedia*. [Wikipedia - Online] 6th March 2008 [cited 7th March 2008]; Available from: [http://en.wikipedia.org/wiki/Moore's\\_law](http://en.wikipedia.org/wiki/Moore's_law).
15. Tyler, N. *Google Checks out Library Books - Press Release*. [Online Press Release] 14th December 2004 [cited 7th March 2008]; Available from: [http://www.google.com/press/pressrel/print\\_library.html](http://www.google.com/press/pressrel/print_library.html).
16. *Introducing Amazon Kindle - Press Release*. [Online Press Release] 19th November 2007 [cited 7th March 2008]; Available from: <http://phx.corporate-ir.net/phoenix.zhtml?c=176060&p=irol-newsArticle&ID=1079387>.
17. Cook, B. *Amazon.com brand*. [Blog] 1st July 2002 [cited 7th March 2008]; Available from: [http://www.brandchannel.com/features\\_profile.asp?pr\\_id=77](http://www.brandchannel.com/features_profile.asp?pr_id=77).
18. *SWOT Analysis Amazon* 2008 [cited 7th March 2008]; Available from: [http://www.marketingteacher.com/SWOT/amazon\\_swot.htm](http://www.marketingteacher.com/SWOT/amazon_swot.htm).
19. *2006 Amazon.com Annual Report*. 2007. p. 96 pages.
20. Motis, V. *New Sony Reader puts a library's worth of reading material in your pocket - Press Release*. [Online Press Release] 4th January 2006 [cited 7th March 2008]; Available from: [http://news.sel.sony.com/en/press\\_room/consumer/computer\\_peripheral/release/9402.html](http://news.sel.sony.com/en/press_room/consumer/computer_peripheral/release/9402.html).

21. *Facial Recognition Slipped into Google Image Search*. [cited 7<sup>th</sup> March 2008]; Available from: <http://arstechnica.com/news.ars/post/20070530-facial-recognition-slipped-into-google-image-search.html>
22. *Mashup (web application hybrid) - Wikipedia*. 2008 [cited 7<sup>th</sup> March 2008]; Available from: [http://en.wikipedia.org/wiki/Mashup\\_\(web\\_application\\_hybrid\)](http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid)).
23. Calhoun, P., Loughney, J., Guttman, E., Zorn, G. and Arkko, J. *RFC 3588 - Diameter Base Protocol*. [RFC Standard] September 2003 [cited 7<sup>th</sup> March 2008]; Available from: <http://tools.ietf.org/html/rfc3588>.
24. Taibi, G. *iShop: Flash Lite-Enabled Comparison Shopping to Go*. 24<sup>th</sup> June 2004 [cited 7<sup>th</sup> March 2008]; Available from: [http://www.adobe.com/devnet/devices/articles/ishop\\_03.html](http://www.adobe.com/devnet/devices/articles/ishop_03.html).
25. *OpenID - Wikipedia*. 4<sup>th</sup> April 2008 [cited 16<sup>th</sup> April 2008]; Available from: <http://en.wikipedia.org/wiki/OpenID>.
26. Ikladius, P., *Interview with Don Waskiewicz*. 2008. Duration: 1h. 20m.
27. Kirkpatrick, M. *OpenID: Google, Yahoo, IBM and More Put Some Money Where Their Mouths Are*. [Online Blog] 7<sup>th</sup> February 2008 [cited 11<sup>th</sup> April 2008]; Available from: [http://www.readwriteweb.com/archives/openid\\_big\\_companies.php](http://www.readwriteweb.com/archives/openid_big_companies.php).
28. Fleischer, P.a.W., Nicole. *Taking steps to further improve our privacy practices*. [Web blog] 14<sup>th</sup> March 2007 [cited 16<sup>th</sup> April 2008]; Available from: <http://googleblog.blogspot.com/2007/03/taking-steps-to-further-improve-our.html>.
29. *Leading Websites Offer Facebook Beacon for Social Distribution*. [Online Press Release] 6<sup>th</sup> November 2007 [cited 16<sup>th</sup> April 2008]; Available from: <http://www.facebook.com/press/releases.php?p=9166>.
30. Nicole, K. *Matchmine Fully Launches Cool Media Recommendations at DEMO*. 25<sup>th</sup> September 2007 [cited 16<sup>th</sup> April 2008]; Available from: <http://mashable.com/2007/09/25/matchmine-launch/>.
31. Nicole, K. *Loomia raises \$5M for Online Recommendation Services*. 2<sup>nd</sup> April 2008 [cited 16<sup>th</sup> April 2008]; Available from: <http://mashable.com/2008/04/02/loomia-funded/>.
32. Dodge, D. *MatchMine leaps ahead*. 9<sup>th</sup> April 2008 [cited 16<sup>th</sup> April 2008]; Available from: [http://microsoftstartupzone.com/blogs/the\\_next\\_big\\_thing/archive/2008/04/09/matchmine-leaps-ahead.aspx](http://microsoftstartupzone.com/blogs/the_next_big_thing/archive/2008/04/09/matchmine-leaps-ahead.aspx)
33. Cashmore, P. *YouTube Mobile Launches in 2007*. 2<sup>nd</sup> November 2006 [cited 16<sup>th</sup> April 2008]; Available from: <http://mashable.com/2006/11/02/youtube-mobile-launches-in-2007/>.
34. *Flickr on your mobile. Share your photos, watch the world*. [Promotional Web Page] 2008 [cited 16<sup>th</sup> April 2008]; Available from: <http://mobile.yahoo.com/flickr>.
35. *CE Makers Can Use Orb To Build Media Apps*. [Online Press Release] 14<sup>th</sup> February 2008 [cited 16<sup>th</sup> April 2008]; Available from: [http://www.orb.com/en/ce\\_makers\\_can\\_use\\_orb\\_to\\_build\\_media\\_apps](http://www.orb.com/en/ce_makers_can_use_orb_to_build_media_apps).
36. Birnie, K. *TechFaith Licenses Dilithium's 3G-324M Video Telephony Stack*. [Online Press Release] 25<sup>th</sup> July 2007 [cited 16<sup>th</sup> April 2008]; Available from: [http://www.dilithiumnetworks.com/company\\_info/press/press\\_news\\_2007/2007.07.25\\_TechFaith.asp](http://www.dilithiumnetworks.com/company_info/press/press_news_2007/2007.07.25_TechFaith.asp).
37. Buchanan, M. *TV on your PC: Hulu, Joost and Miro reviewed*. 20<sup>th</sup> November 2007 [cited 16<sup>th</sup> April 2008]; Available from: <http://gizmodo.com/gadgets/video-wars/tv-on-your-pc-hulu-joost-and-miro-reviewed-323787.php>.
38. *Verizon V-Cast Mobile TV*. [Online promotional material] 2008 [cited 16<sup>th</sup> April 2008]; Available from: <http://products.vzw.com/index.aspx?id=mobileTV#grid>.

39. Pham, A. (28th January 2008) *TiVo's evolution: Executive hits fast forward on TV device business*. Los Angeles Times [cited 16<sup>th</sup> April 2008]; Available from: [http://www.mercurynews.com/business/ci\\_8098493](http://www.mercurynews.com/business/ci_8098493).
40. *World Internet Usage Statistics News and Population Stats*. 20th March 2008 [cited 14th April 2008]; Available from: <http://www.internetworldstats.com/stats.htm>.
41. Simmons, N. *China Blocks Google News, YouTube Following Tibet Riots*. 18<sup>th</sup> March 2008 [cited 16<sup>th</sup> April 2008]; Available from [http://www.newslocale.org/sci%10tech/stnews/china\\_blocks\\_google\\_news\\_youtube\\_following\\_tibe\\_t\\_riots\\_20080317979.html](http://www.newslocale.org/sci%10tech/stnews/china_blocks_google_news_youtube_following_tibe_t_riots_20080317979.html).
42. Oweis, K.Y. *Syria blocks Facebook in Internet crackdown*. 23<sup>rd</sup> November 2007 [cited 16<sup>th</sup> April 2008]; Available from <http://www.reuters.com/article/worldNews/idUSOWE37285020071123>.
43. Deans, D.H. *4G Subscribers Latest Worldwide Forecast*. 7<sup>th</sup> March 2008 [cited 16<sup>th</sup> April 2008]; Available from: <http://dhdeans.blogspot.com/2008/03/4g-subscriber-latest-global-forecast.html>.