

An introduction to Mashups and implementing Affiliate Marketing using Mashups

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ABSTRACT

With the technical evolution in the WWW world there has been a great scope for innovative technologies to flourish. One such technology is mashup. Mashup allow having altogether a new service from the existing one on the web. Here we present an introduction to mashup technology including the architecture, the types and the tools/editors. Among all the tools/editors we choose Yahoo! Pipe and discuss it. Then we discuss the various applications of mashup. And apply mashup for implementing the Affiliate Marketing. We create Yahoo! Pipe for implementation and simulate the Affiliate Marketing process using this Yahoo! Pipe. Finally discuss the challenges of mashups.

Keywords

Mashup, Yahoo! Pipe, Affiliate Marketing, Affiliate, Merchant.

1. INTRODUCTION

Mashups are rising as an innovative generation of technology for not programmers and web developers who want to make use of the various products and services available on web. As the name implies, mashups mix and “mash” the programming interfaces from different companies’ products and services to create new products and services. Yahoo, Google, Amazon, eBay, and Microsoft have published application programming interfaces (APIs) based on web standards that allow you to utilize their complicated functionality even without being a programming expert [2].

1.1 Mashup Definition

Mashup originally referred to the practice in pop music (notably hip-hop) of producing a new song by mixing two or more existing pieces.

In technology, a mashup is a web application that combines data from more than one source into a single integrated tool; an example is the use of cartographic data from Google Maps to add location information to real-estate data, thereby creating a new and distinct web service that was not originally provided by either source.

Thus, a website or web application which combines contents from different websites is termed as mashup as illustrated in Figure 1.

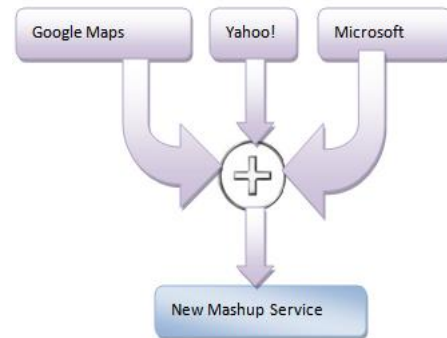


Figure 1: Mashup definition

Mashups have recently exploded on the web, for two main reasons [3].

Firstly, many of the major internet companies, such as Yahoo!, Google, and Amazon, have opened up their data to be used with other data sources without a lengthy licensing negotiation. In just a minute or two, you can set up and use the data resources they make available.

Secondly the advent of new tools that makes creating mashups easy for anyone, regardless of their technical know-how.

Reasons to use Mashups:

- Mashups is a great technology to create light-weight, data-centric applications for everyday-use. [27]
- Mashups allow for the reuse of existing applications.
- They also allow for rapid application development.
- Development of a mashup does not necessarily involve extensive coding skills.
- The associated cost of application development is greatly reduced.
- Applications are better tailored to users' needs since the users can now incorporate content that they were unable to develop themselves due to time or resource constraints.
- Has varied areas of applications like mapping, photo, search, video, price/product comparison, as well as ecommerce (marketing).

1.2 Types of mashups

There are various types of mashups existing depending on the purpose they serve: map mashups, photo mashups, video mashups, search mashups and e-commerce mashups figure 2. Figure 2 shows the various mashups taking the input source from various APIs like yahoo, Google, Microsoft etc.

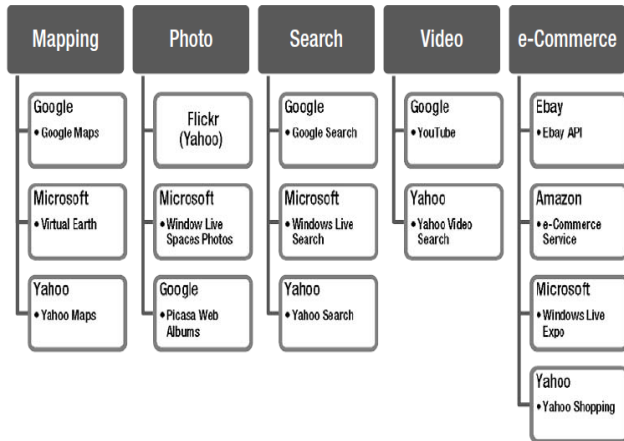


Figure 2: Types of Mashup

Besides these, the mashups can be classified as:

1. Data mashups: It brings together and cross references data from various web sources. A data mashup mixes data of similar types from different sources, as for example it could create a market share report by combining an external list of all houses sold in the last week with internal data about which houses one agency sold.
2. Consumer mashup: The best known type is the consumer mashup, best exemplified by the many Google Maps applications. It deals with different visualizations and data elements for more appealing consumption of information.
3. Business mashups: It has internal combinations of company resources often enhanced with external web services. A business mashup is a combination of all the above, focusing on both data aggregation and presentation, and additionally adding collaborative functionality, making the end result suitable for use as a business application. Now a day's more and more business organizations are opting for business mashups to increase their profit.

For example, the Viral Video Chart (viralvideochart.unrulymedia.com) site can be treated as consumer mashup that tracks YouTube (www.youtube.com), MySpace (www.myspace.com), and Google Video (video.google.com) in order to identify the most talked about new clips, overall and by category figure 3.

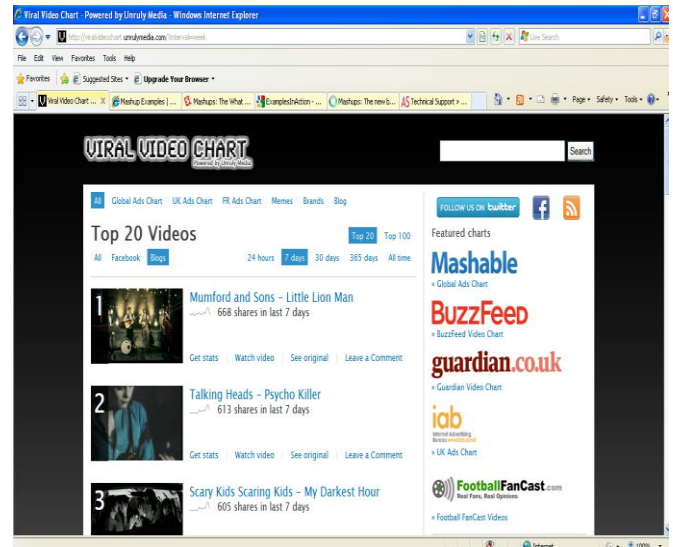


Figure 3: Viral Video Chart example (most talked videos)

1.3 Mashup Architecture

The mashup architecture is basically a layered architecture with three layers, the presentation or interactivity layer, next web service or the API layer and data manipulation layer. Figure 4 is the mashup architecture. The presentation/interactivity layer is the user interface of the mashup. HTML, styled with CSS, displays the mashup interface to the user. JavaScript, with Ajax techniques, enhances the user's experience by making the mashup more responsive and desktop application like. JavaScript also receives the user's input and, if necessary, initiates requests to the web services APIs used by the mashup.

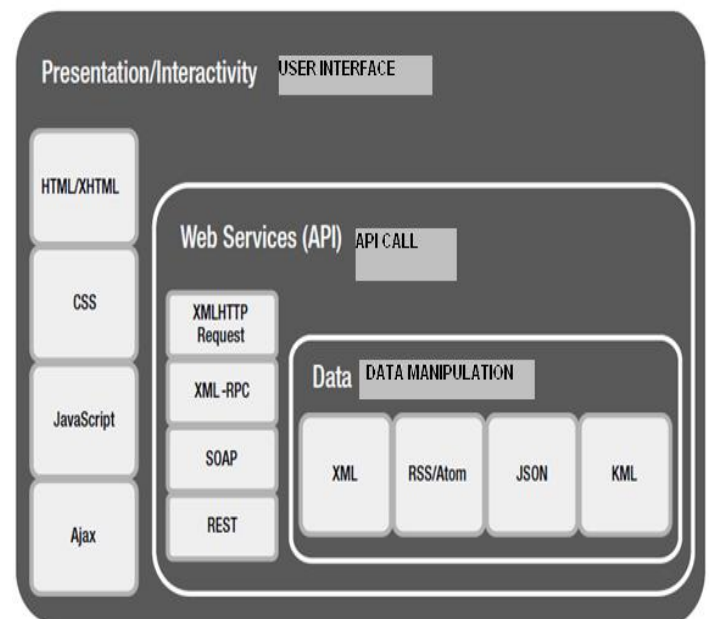


Figure 4: Mashup Architecture Layers

For example, in a book search web application, users could search for a book they want to buy by entering the book's ISBN into the interface. Regardless if we're talking about XML-RPC, SOAP, or REST web services, XML HTTPRequest is used to send the book's ISBN using XML or JSON to the server. The book data (e.g., price, author, abstract and so on) stored on the server is retrieved from a database of books and formatted (usually in XML, but increasingly in JSON) before it is returned to the presentation and interactivity layer. Once returned, JavaScript is used display the book's title, author, and cover image using HTML with CSS.

To create a mashup one must know the answers for the following questions:

- i. Which API calls are required? (REST, XML-RPC, SOAP, JavaScript)
- ii. How is the Data Manipulation done?
- iii. How the presentation is done?

Thus mashup can be formulated as below:

Mashup = API calls + Data Manipulations + UI [4].

Figure 5 shows how the API calls are forwarded to intended websites and the data is integrated at the mashup website and finally displayed for the user.

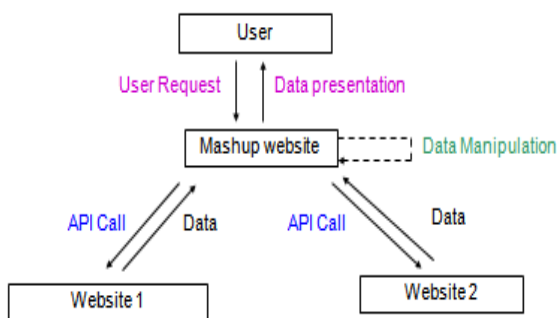


Figure 5: Working of Mashup

1.4 Mashup creation tools and editors [5]

There are various tools and editors for developing the mashups. Following are some famous tools and editors for mashup creation.

- i. Google Mashup Editor – mashup editor by Google
- ii. Yahoo Pipes - an innovative RSS mashup engine by Yahoo!
- iii. Microsoft Popfly - mashup IDE from Microsoft
- iv. Geomoney - visual Google Maps mashup creator
- v. Schmapplets - similar in concept to Geomoney, but has interesting offline capabilities
- vi. Wayfaring - visual Google Maps mashup creator

For the implementation of mashups in this paper we use Yahoo! Pipes.

2. Yahoo Pipes

Yahoo! Pipes are free online service that lets you remix popular feed types and create mashups using a visual editor. You may use Pipes within your Web applications, or you may publish and share your mashups as Web services without ever having to write a line of code.

To create or edit a pipe, user has to sign up with a Yahoo! ID. After signing up, user doesn't download a plug-in or a program. Creation and edition of the pipes are completely online. User selects the "Create a pipe" option to open the Pipe Editor. Pipe editor is composed of three panes which are the canvas, the library and the debugger. The pipe is created using these panes. After creation, pipe is saved and run. Then user gives a name to the pipe and writes a short description of it. If creator of the pipe decides to publish the pipe, pipe becomes visible for everyone. Other users can clone the pipe. Then they can use and edit their copy for their own use.

2.1 Advantages of using Yahoo! Pipes

1. Yahoo Pipes lets you parse websites and rss feeds, combine them, etc. You can take a website that has no rss feeds and make custom ones for it. You can also modify rss feeds to show up how you want.
2. Yahoo Pipes are also nice as they are constantly updated. [7]
3. These are as easy to use as any other type of drag-n-drop style application. You can use a pipe out of the box, customize or modify an existing one or simply start from scratch and make your own mean machine. [6]
4. "Pipes are a powerful composition tool to aggregate, manipulate, and mashup content from around the web." A series of different commands are linked together so that output can be filtered, customized, manipulated even more. It uses RSS feeds as input, so all you really need is to know the URL.
5. User can channel all of the chosen feeds into one, and then can sort it however user see fine.
6. User can geocode the feeds and then browse them using an interactive map.
7. User can build custom vertical search pages; build widgets and badges, turn the output of feeds into any other format, the possibilities are endless.

Figure 6 shows the Yahoo! Pipe editor with a pipe implementation of news for football. The source for this pipe is taken from three websites, timesofindia.indiatimes.com, sports.yahoo.com, and www.sports.news.in. Here the news from all the three websites is gathered and then a filter is applied to have only the news feed related to football. Thus this pipe will dynamically display the football news for the football fan. The pipe can be changed or reused to display other type of news like cricket.

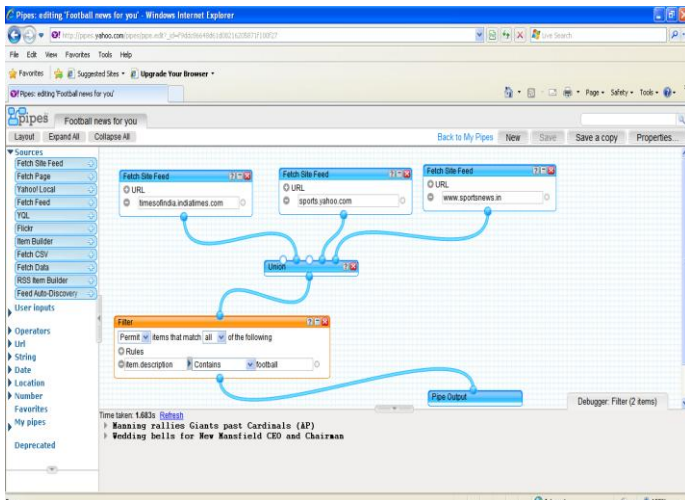


Figure 6: Source Pipe for news mashup using Yahoo! pipes.

2.2 Applications of Yahoo! Pipes

- i. Yahoo! Pipes can be an excellent tool for compiling a list of feeds on something of interest to you in one location.
- ii. To track updates and news relating to job postings, hobbies, professional matters, the stock market, current events, weather, transportation, blogs, people, companies, institutions, local festivals, and much more.
- iii. Also these can be used in educational systems say to give students the contents of course.
- iv. In e-commerce these can be used in marketing, price comparison, and product comparison, affiliate marketing.

3. Affiliate marketing

3.1 Overview

In the mid-90's Amazon.com pioneered the idea by enabling website owners to link to their books and earn a commission if someone clicks over from their Web site to Amazon and buys the book.

In affiliate marketing program, one website helps another by putting up advertisement, content or link on another site which helps in generating traffic to their site. [9] An online Affiliate Program (figure 7) is a revenue-sharing marketing strategy in which affiliates will drive traffic to a merchant's website in return for a portion/percentage of the revenues the merchant receives from that traffic, where

Merchant is the one who wants to sell the products or services through his website.

Affiliate is the one who is promoting through his website the products or services to the merchant website.

When a visitor to an affiliate site clicks on the link a cookie is loaded. This cookie logs information on the affiliate so when they buy from merchant site the affiliate software picks up this information, and logs the sale to that affiliate.

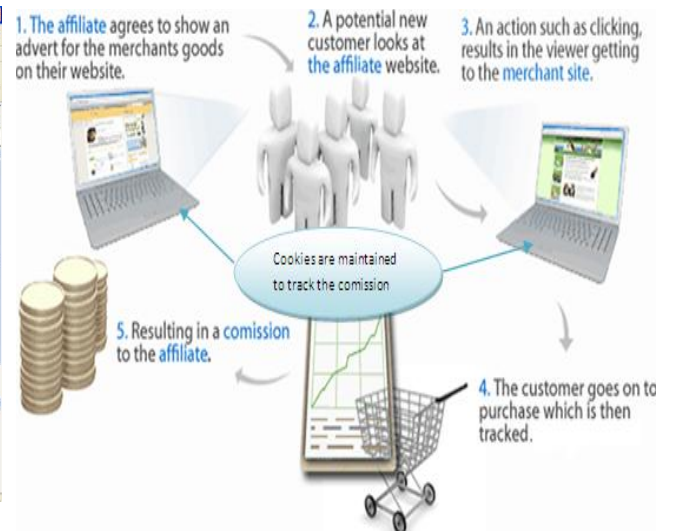


Figure 7: Affiliate Marketing [12]

3.2 Technical issues in the existing system of Affiliate Marketing

- i. Working with Affiliate Links and HTML Code. The technical side of creating affiliate links, or working with HTML code, is a hurdle for many people when they get into Affiliate Marketing.
- ii. The hardcoded links are not always the best approach for marketing if there are more products/services to be marketed then the process gets lengthy to have all of them at one place. It becomes difficult to update the hardcoded links.
- iii. A single RSS feed may not give the commission for each click through if it has many products/services in it.
- iv. Slower to develop than other types of online marketing strategies.

4. Implementing Affiliate Marketing using Mashups

Let us consider a scenario of selling magazines and books on web.

EXAMPLE 1:

As the first example we create a RSS feed from different sources in which we will have the list of the books to be sold.

The simplest way to create a book list is to concatenate a series of items in a pipe, figure 8.

In this pipe we have used:

- i. The `itemBuilder` module to create each item, with RSS title and link fields set to the title of the book and the click through link respectively.
- ii. The `union` module concatenates all the items into single feed.

But what is the point; this book list can be viewed by visiting the websites of that book. Yes there is a point; we

have defined the book list at one place. You can click the URL of this pipe and get the books at one place.

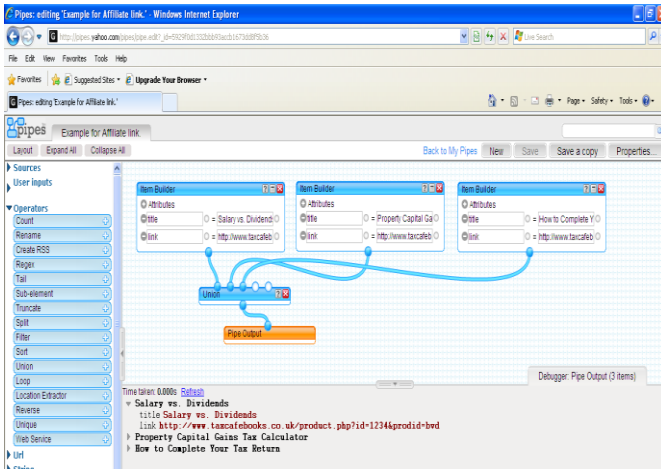


Figure 8: Yahoo! Pipe for dynamic book list

And if in future we change the pipe to include another product (book), the new product will be visible automatically to our blog readers and web page readers, thus making the pipe reusable and dynamic.

EXAMPLE 2:

Even though we have provided a dynamic book list in previous example, as an affiliate one cannot get the referral fee for all the click-through led by this RSS feed. This is because the all URLs may not have the affiliate id in them.

In this example shown in figure 9 we consider two different websites (assuming both belong to the same affiliate) to sell it on the merchant website.

For this, the merchant will provide an affiliate id to the affiliate. And using this affiliate id the merchant will pay the referral fee for the purchase made by the customer.

The RSS feed for the books is as below:

<http://feeds2.feedburner.com/DotSauce>

<http://www.penguin.co.uk/PenguinBusiness2.xml>

These RSS feeds list all the books with hyperlink to their individual product web pages. But the problem is as discussed earlier, that the individual hyperlinks do not include the entrepreneurs affiliate id, so merchant won't be able to pay the affiliate the commission for each click-through. This problem can be solved by designing the Yahoo! Pipe as shown in figure 8.

In this pipe we have used:

- i. A **fetch feed** module retrieves the input feed from the url: <http://feeds2.feedburner.com/DotSauce>
- ii. A **loop** module loops through each item in the input feed and executes an embedded **URL builder** module for each link inside.

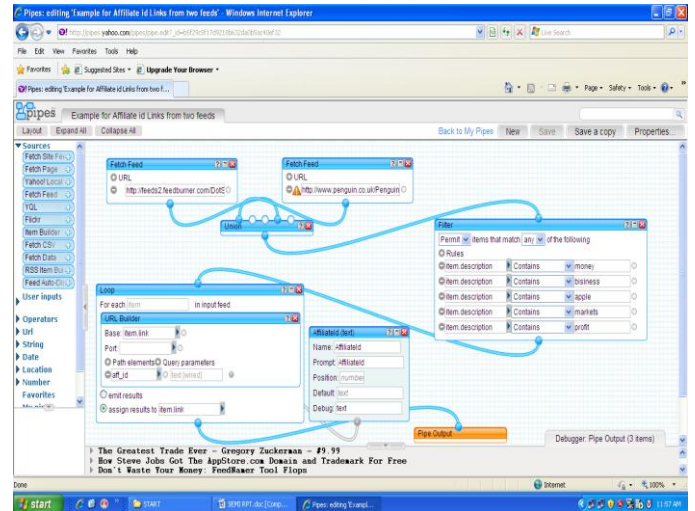


Figure 9: Example 2 using loop and URL Builder module.

- iii. The **url builder** module takes its base url form the item link element of the input feed and appends a query parameter to the link url <http://feedproxy.google.com/~r/dotsauce/~3/ZQICVlu2wyw> becomes

<http://feedproxy.google.com/~r/dotsauce/~3/ZQICVlu2wyw/?ref=1234>

- iv. The name of query parameter is hardcoded as **Aff_id**; its value is actually wired up to the text input module titled **AffiliateId**. This means we can change this, at run time without modifying the pipe.

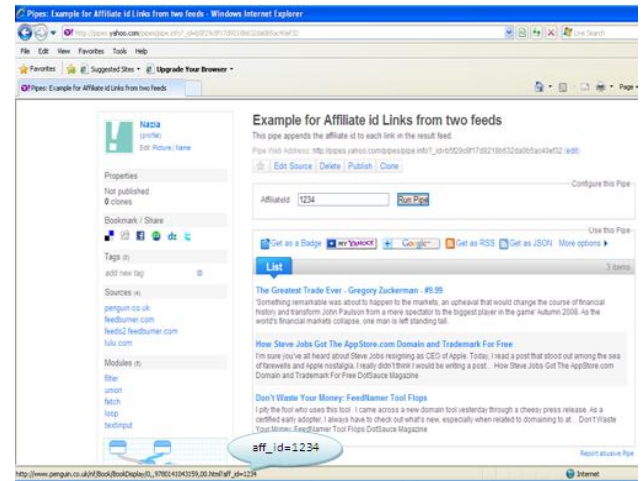


Figure 10: Output for Example 2

When we run the pipe, it prompts for an affiliate id and this way the id is appended to all click through. So not only have we created a pipe that personalizes the feed for the books with our affiliate id, also we could invite other people to use the pipe to sell the books using their affiliate id, except the merchant really have an affiliate program with them. This is shown in figure 10.

5. Simulation

In this simulation we have created two hypothetical websites as:

- Strategic book Marketing (the affiliate website) shown in figure 11 and
- ebook Merchant Shop (the merchant website) shown in figure 12.

It is assumed that there is a legal agreement between the affiliate and the merchant website. And the merchant website has allotted '1234' as the affiliate id to the affiliate website, so that any customer buys the book with that affiliate id the merchant can understand that it belongs to Strategic book Marketing.com and can pay the commission to the respective affiliate.



Figure 11: Affiliate website 'StrategicbookMarketing.com'



Figure 12: Merchant Website 'ebookMerchantShop.com'

Here the pipe in example two is simulated so that all the internal links of the feed has the affiliate id appended to it. Now when the customer browses the affiliate website 'Strategic book Marketing.com' to buy the book/s he/she is forwarded to the merchants website 'ebook Merchant

Shop.com'. Here all the various categories of books are displayed in the merchant's website and here we give the URL of the Yahoo! pipe.



Figure 13: The cookie with URL, IP, referral fee and no. of clicks

When the customer clicks the link to purchase the book/s, those many time/s the URL count is updated in the cookie. The cookie also has the ip address where it has come from and the referral fee that is to be paid to the affiliate. Figure 13 displays the cookie at the Strategic book Marketing.com

6. Challenges and Limitations of Yahoo! pipes for mashup construction [16]

- For creating a pipe that is comprehensive enough to get all available information, while also filtering out irrelevant material, a user must understand the functions of specific modules and how they relate to each other and also the content a user wants must be available in a format Yahoo! Pipes accepts, ideally an RSS feed.
- Even a well designed pipe will count for little if compatible content is sparse.

To establish mashups as an efficient technology for resource integration the following seven challenges should be solved where some of these challenges are not only unique to mashups but also to the World Wide Web.

- Cataloguing:** Some Web pages are already available that list mashups and provide an interface for searching of mashups such as programmableweb.com. Mashup creators can insert their mashups in the list and thus share their mashups with others. But what is missing is a directory that stores and catalogues the mashups in a consistent way.
- Data integrity:** Mashups are a quick way to create new applications but they can raise data integrity problems when changes of end-users are not valid against the underlying commitment. Another concern may raise integrity problems if e.g., an end-user finds a service that brings some value to the data or functionality included in the mashup. Then mashups need to be modified at runtime. Thus, when running a mashup control

mechanisms should be considered that ensure the integrity of the mashup against end-user changes.

- iii. Making data Web-enabled: Mashups are constructed of different resources that are available on the Web. However, currently a lot of data and functionalities are not set up on the Web and thus are not accessible via feeds, HTML or Web services. To make more resources “Web-enabled” require formats and tools that facilitate an efficient access and the connection of resources to the Web.
- iv. Security and identity: While security challenges have been identified for mashups only few approaches exist that try to handle security lacks and identity of mashups. Security challenges emerge when end-user connect dynamically to Web sites and not necessarily under the provider’s control. Additional security challenges arise if the mashup contains confidential data or security log-ins are required to enter some data. This requires mechanisms to control the user connection and the data security.
- v. Sharing and reusing: The next concern for mashup construction is that vendors of mashup tools should provide mechanisms to allow end-users sharing their built mashups with others and thus facilitating the reuse of pre-built mashups. This means also that mashup owners need to give their permission before making the mashup available for the community. To facilitate a (legal) resource sharing the mashup should be defined in a format that is readable by different machines and consider accountability.
- vi. Trust certificates: The owner of such a directory service can issue a license that certifies the mashup. Because so far, no certification mechanisms exist that guarantee end-users the trustworthiness of the mashup. Similar to trust certificates for online shopping it is imaginable that mashup owners grant a license at the owner of the directory service. In case of a positive certification the mashup owner can assure end-users the trustworthiness of the content and also the integrity of the mapping application.
- vii. Version control mechanisms: Mashups consist of different resources collected from various sources. Resource owners are responsible for their content and can change and update its content or respectively its software whenever they regard it as necessary. To keep the mashup content up-to-date aversion control mechanism is required that automatically informs the mashup owner about updates of the integrated underlying software (imagine the mashup is build upon several APIs)

7. Conclusion

Consequently the use of mashup in affiliate marketing has significantly contributed the customers, the merchants as well as the affiliates. Customers get all the products at one place, affiliates get their fare share for each sale and are happy, merchants get more sale as the customers and the affiliates are satisfied.

Also technically it provides:

- i. Minimized application data management: Information goes stale very fast in this day and age, by using pipe implementation you can ensure reduced costs related to maintaining and updating your own data repositories.
- ii. Reduced development effort: Tailoring data to a particular application often implies lengthy development times, but customizing information through Yahoo! Pipes which has been thoroughly tested and designed the development efforts can be reduced.
- iii. Unlimited data sources: Once the service in your application is structured as pipe, swapping between the growing numbers of data sources available on the web can create an exponential number of possibilities for all your developments, since all providers are based on the same industry standards.

Until recently, most data on the web was posted as monolithic documents structured around the HTML markup language, a format ill suited for reusing and manipulating data for building derivative applications. With the major shift of providing software as services, an unlimited number of data service providers can now be leveraged using industry accepted standards to create elaborate Mashup applications [31]. Having a large domain of applications mashups is gaining more interest for developing new applications and services. But being a very new technology there are no mashup standards, this only makes it increasingly difficult to design and implement security mechanisms.

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