To: Investors **From: RFB** **September 2, 2005**
Re: YouTube

Introduction

YouTube represents an interesting seed-stage investment opportunity. The company's goal is to become the primary outlet of *user-generated video content* on the Internet, and to allow anyone to upload, share, and browse this content.

The three entrepreneurs are scrappy and smart. They have built a very easy-to-use, fast growing service that taps several strong veins: user-generated content, online advertising, wide proliferation of inexpensive digital video capture devices, and continued broadband adoption.

The company has also developed code snippets that allow users to embed YouTube videos directly into other sites. In this way, the company is building a wide content distribution network, in addition to its direct-to-site traffic.

Deal

Our proposal is to invest $1m in the seed stage, followed by a $4m Series A once specific milestones are met. Sequoia would own ~30% post Series A, with a pool of ~17%.

Competition

There are several direct and potential competitors to YouTube. These include:

- direct competitors (dailymotion, vimeo)
- community photo sites (flickr, webshots)
- online photo sharing sites (ofoto, shutterly, snapfish)
- large internet players (Google & Yahoo video search)
- entertainment sites (big-boys, ebaumsworld)
- file sharing services (ourmedia.org, putfile)
- IPTV companies (Open Media Network, Brightcove)

YouTube appears to have a clear lead over its two direct start-up competitors. The other categories of potential competitors are not necessarily focused on video content, or are not focused on user-generated content within the context of a community-based site. Nevertheless, the company will need to stay very focused over the next 3-6 months to ensure that it builds a rich set of features and content depth to increase its defensibility.

Hiring plan

We need to help the company quickly hire a CEO and VP BD/Sales. The founding team is enthusiastic about bringing on an experience CEO to help lead the company. However, I'm not sure whether we can land a CEO before the Series A. I would appreciate any ideas on potential candidates for either role. My preference would be to launch a search immediately and to have a CEO in place within 90 days.

Two additional former PayPal engineers are set to join in the next week. Both are exceptional.

The plan is to house the company in our incubation area for the near term. That will help us frequently interact with the team until we can surround the company with an experienced management team.

Key risks

- Competition/defensibility

  As outlined above, YouTube faces significant potential competition. The company needs to remain laser focused on improving the user experience to ensure that it continues its early growth trajectory.

- Revenue model

  I believe that YouTube has a clear advertising revenue opportunity. However, we don't yet know what form of advertising would work best. Specifically, can the company develop attractive ad products that are not intrusive to the consumer experience? We can model revenue as follows: # unique videos streamed per day x % of videos monetized x CPM x 365 = estimated annual revenue. Several of the parameters are unknown:

  i. We don't know what CPM rates YouTube could command. Video ad CPMs could range from a low of $5 to over $30.
  ii. We don't know what percentage of inventory (videos served) could be monetized
  iii. We are not sure how much YouTube could grow from its current level of 100,000 videos served per day.

  Below are different scenarios and their associated revenue potential:

	Videos served/day	**CPM**	**% of videos monetized**	**Implied annual revenue**
Scenario 1	10 million	$10	15%	$6m
Scenario 2	20 million	$15	20%	$22m
Scenario 3	30 million	$20	25%	$55m

  We will need to test these assumptions carefully over the next few months to get an accurate handle on the company's revenue potential. We also need to test the success of the company's content distribution network, and whether we can generate advertising revenue from this network. (Google earns ~55% of its revenue from Google-owned sites, and 45% from Network websites.)

  Serving 10-30 million videos may appear daunting, as it represents >100x increase over the company's current activity levels. But the company has achieved its current scale in only two months, and only has 15,000 videos today. (For point of comparison, Flickr and Webshots, two comparable photo community sites, serve 200-500x as many pageviews per day as YouTube.)

- Scalability

  As the table above indicates, YouTube will need to scale significantly from its current level for the company to achieve meaningful revenue. We need ensure that YouTube can inexpensively scale orders of magnitude from current levels.

- Balancing growth

  YouTube has already drawn the attention of larger media companies (e.g., Turner, Transcosmos) that see the potential of distributing YouTube content. As with any marketplace, we need to ensure that we balance demand and supply. It would be inadvisable to grow the viewer base significantly without a substantial increase in the number of videos available on the site. The company cannot afford to disappoint large numbers of customers due to inadequate depth of content.

- Exit

  We cannot point to many high comparable exit valuations.

  A few comparable companies include Webshots, flickr, Ofoto, Shutterfly, and Snapfish. While these companies deal only with still images, there are some similarities with YouTube. None of these companies have had exceptional exits. CNET bought Webshots for ~$70m, Yahoo! bought flickr for <$50m. Apparently Shutterfly is preparing to file its IPO. Ofoto and Snapfish were acquired by Kodak and HP, respectively, although financial terms were not disclosed.

  Another comparable is Blogger, acquired by Google in 2002 for an undisclosed amount.

  There are some other examples of businesses that built successful models leveraging user-generated content, including Tripadvisor, acquired by IAC in 2004 years ago for over $100m (to the best of my knowledge).

Recommendation

I first met with the company three weeks ago, and we are in pole position for the financing. Several VCs have been cold calling the company, and a few media companies have also approached YouTube. I'd like to give the company our decision on Monday.

I recommend that we proceed with the financing as proposed.

YouTube has a great founding team that has hit on several promising themes. The company follows a trend of user-generated content that started with text (blogs), images (flickr, webshots, ofoto), and audio (podcasting). Video is a natural next step, and YouTube is well positioned to capture the lead. The company has not yet enabled advertising revenue streams. But our checks with Yahoo! and Adbrite indicated very strong advertiser demand for online video advertising. We will rapidly need to surround the company with management talent, specifically a CEO.

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Investment summary

Founded by three early PayPal employees. Two engineers, one designer. Seed-stage investment opportunity. Top 10,000 internet site within two months of launch.

- **Business**
  - YouTube's goal is to become the primary outlet for *user-generated video content* on the internet. The company provides a very easy-to-use interface for users to upload, share, and browse their content.
  - Every digital camera now ships with digital video recording capability. But consumers have no easy way to share their personal video content – files are too large, hosting and bandwidth is expensive, and there are no standardized video file formats.
  - Users upload videos to YouTube. The encoding backend converts uploaded videos to Flash Video, which works on ~98% of web browsers. The streaming format means that no file downloading is required.
- **Market**
  - YouTube provides a platform and community for video self-publishing. We've seen similar self-publishing emerge for text (blogs), photos (flickr, webshots, hotornot), and audio (podcasting). This presents interesting advertising revenue opportunities.
  - There are also interesting vertical market opportunities: eBay auction videos (e.g., autos), real estate videos, etc.
- **Financials – TBD**
  - The company currently serves 100,000 videos per day, at an all-in hosting cost of $4,000 per month.
  - The team has developed a software abstraction layer that enables it to use very inexpensive hardware and bandwidth to deliver videos.
- **Competition**
  - Big players: Google Video Search, Ourmedia.org, Open Media Network
  - Small players: DailyMotion, Vimeo, Putfile
- **Team**
  - Steve Chen. UIUC, CS. Recruited as one of PayPal's earliest engineers
  - Chad Hurley. PayPal's first designer, responsible for site design and logo
  - Jawed Karim. UIUC, CS. Graduate CS student at Stanford. Also one of PayPal's earliest engineers
- **Proposed terms**
  - Two-stage, milestone-based financing: $1m seed stage, $4m Series A.
  - SC to own ~30% after Series A.
  - Proposed Series A milestones:
    - Develop comprehensive business plan, including financial plan
    - Develop self-serve advertising product
    - Sign up at least five (5) advertisers who place $5,000 or greater advertising orders
    - Ensure platform scalability to handle at least one million video views per day
    - Recruit a VP of Business Development

Competition

There are several potential and direct competitors to YouTube.

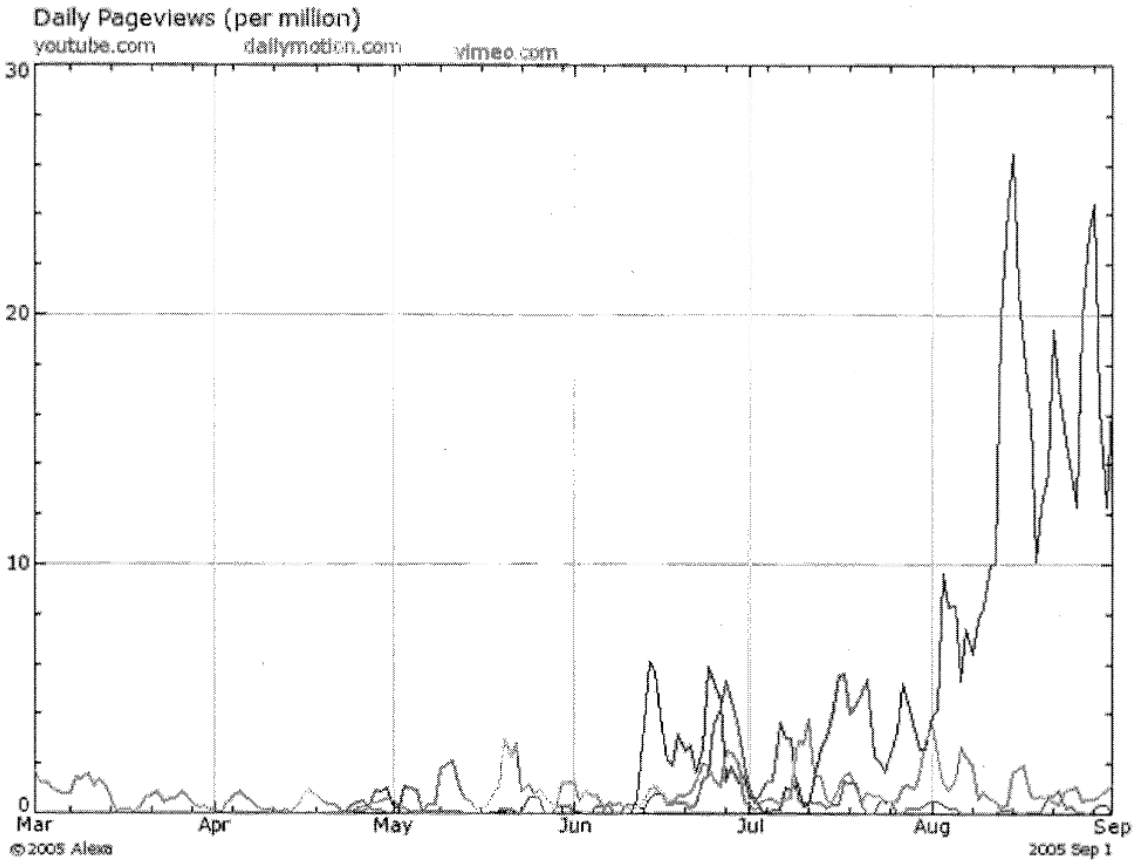
1. Direct competition

The two direct start-up competitors are Dailymotion and Vimeo.

- Dailymotion is based in France. It positions itself as a site to 'watch, publish, share.' The site has pretty good UI, but its navigation and layout is not as intuitive as for YouTube. All videos are encoded and rendered in Quicktime. Quicktime has lower penetration than Flash, so users may be faced with needing to download the player to experience the site.

- "Vimeo is for sharing your video clips." Vimeo was started by Connected Ventures in New York. Their mission is to "develop and manage good websites." They also run a popular site called CollegeHumor. The also claim to draw inspiration from flickr, and launched in February 2005. Vimeo also uses Quicktime. Their site layout is not very intuitive, and makes it hard to find content (e.g., there is no search capability).

The graph below shows the comparative daily pageviews for YouTube, Dailymotion and Vimeo. YouTube's traffic has rapidly overtaken that of these two competitors.



2. Community photo sites

Community photo sites share many features with YouTube: tagging, social networking, discussion groups, ease-of-use. However, they seem focused on still images rather than video.

YouTube admits that it drew inspiration from the popular site Flickr. Flickr has ~200-300x the number of daily pageviews of YouTube. Yahoo! acquired Flickr earlier this year for an undisclosed sum, believed to be ~$30m. Reid Hoffman was in investor in Flickr, and assures the YouTube team that they have no plans to launch a video product in the next 1-2 years.

Webshots is another potential competitor. CNET acquired the company in 2004 for ~$70m at a time that they forecast $15-17m annual revenue. The founding team all just left the company, and it unclear how much new product innovation there is. Webshots seems very focused on photos for now.

3. Online photo sharing sites

The main online photo sharing services, Ofoto, Shutterfly, and Snapfish, are also potential competitors. They do not have community-like features. They also earn revenue primarily from printing. As a result, I think they will remain focused on photos.

4. Entertainment sites

There are several popular online entertainment sites that have significant traffic: Big-boys, ebaumsworld, ifilm.

According to YouTube: "Big-boys and ebaumsworld get a lot of traffic but that's to be expected for the type of content they host. You are guaranteed to have something interesting, something shocking to watch when you visit these sites. However, the disadvantage is that they can never transition their sites into an actual product. Due to the content on the site, they're forever stuck in that segment of the market. If I were to categorize the content on YouTube today, I would break it down into two large categories: personal videos and viral videos. The viral videos, due to copyrights and obscene content, I admit, big-boys and ebaumsworld may beat us there. Although, we have seen our share of viral videos on YouTube. The bigger draw for YouTube is all the personal videos, the ones of your pet, your kid, your family, your vacation, so on. Big-boys and ebaumsworld, due to their origins, can never transition their product into something that hosts these other types of files."

Big-boys and ebaumsworld also position themselves as much broader entertainment sites, offering "Jokes, Pictures, Office Humor, Flash Animation, Soundboards, Prank Calls, Audio, Video, Games, Illusions, Magic."

"IFILM is one of the leading video-entertainment destinations on the Web, offering channels of movies, short films, TV clips, video-game trailers, music videos, action sports and its celebrated Viral Videos collection. IFILM.com delivers more than 30 million streams per month, making it one of the top ten streaming media sites in the world." IFILM is a clear potential competitor, although they don't have the same focus on user-generated content, nor YouTube's community features.

5. Larger competitors

Google and Yahoo are building video search products. Google requires the user to download a new "Google Video Viewer" while Yahoo plays videos in the native file format. In neither case are they providing the simple consumer upload and share experience, nor the community features.

6. File storage services

Putfile and Ourmedia.org are examples of file storage providers that essentially provide a free, web interface to FTP. None of them seem to have a compelling product, and do not focus solely on user-generated video content.

7. IPTV

Finally, there are companies such as the Open Media Network and Brigthcove that are focused on the delivery of mainstream video over the Internet. I do not believe that this competes directly with YouTube's proposition.

The table below attempts to summarize the competitive matrix:

	YouTube	Direct competition	Community photo sites	Photo sharing services	Entertainment sites	Large Internet players	File storage	IPTV
Ease of submitting video/degree of automation	Easy	Easy	N/A	N/A	Not easy or auto-mated	N/A	Easy	N/A
Focus	Video	Video	Photos	Photos	Varied	Varied	Varied	Video
Community features	Yes	Yes	Yes	No	No	Yahoo working on it	No	No
Rendering format	Flash	Quick-time	N/A	N/A	Quick-time	Varied	Varied	Varied

The Technology Infrastructure (company supplied)
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As mentioned previously, in order to keep costs down, our video distribution technology is built on clusters with multiple machines in each cluster for redundancy and higher throughput. When a video is uploaded to the site, it is sent to a single machine within a single cluster. This is chosen based on space and, in the future, cpu/bandwidth utilization on the machine and cluster. Newly uploaded videos are picked up by two services running on each of the machines, 1) convert and 2) replicate.

The converter will analyze the video and look at things like framerates, aspect ratios (16:9 vs 4:3), audio encoding (sampling rates, audio codec), and the video codec used on the original video. It uses these heuristics to best convert the video to play on YouTube with adjustments to things inserting the black bands on top/bottom of a 16:9 video, altering the sampling rate to best conform to the incoming sound, guess at frames per second of the incoming video, etc. As part of this process, video stills of each video are also generated.

At the end of this process, the video server communicates back to the central database changing the status from "Uploaded" to "Awaiting Replication".

While all this is going on, the replication service is standing by looking for videos that need to be replicated. When a video enters this queue, it's picked up by the replication service and the video is replicated to every machine within the video cluster. After the replication is finished, it talks to the database and marks the video as "Processed".

A newly uploaded video will go from a "Uploaded" -> "Awaiting Replication" -> "Processed" state in about 1-2 minutes.

The best part about this technology is that it really is infinitely scalable. We can add more capacity directly at the video conversion/transport layer at will.

The math for this comes out to:
By bandwidth --
$239 / 1 machine / 1 month
1 machine has 2000 GB transfer / month
2000 GB * 1000 MB / GB = 2,000,000 MB transfer / machine / month
7 MB average size of video
2,000,000 / 7 = 285,714 videos served from each machine / month
$239.0 / 285,714 = $0.00083 cost per video served.

By storage --
$239 / 1 machine / 1 month
1 machine has 2x160 GB HD for 320 GB
320 GB * 1000 MB / GB = 320,000 MB / machine
7 MB average size of video
320,000 / 7 = 45,714 videos / video cluster
$239/45,714 = $0.005228 cost per video stored.
$0.005228 * 2 machines / cluster = $0.010456 / video replicated.

The video serving technology provides a substantial barrier to entry. The video clustering solution sounds obvious and straight-forward post implementation but it certainly wasn't when we were faced with the question of -- "how do we keep costs down while having access to massive storage/bandwidth?" There's also the encoding technology. We're constantly improving this side of the product by incorporating the latest codecs.

Team bios

Chad Hurley is a co-founder of YouTube. Chad has an experienced background in web development and graphic design. He was the first member of the PayPal design team, where he lead efforts to develop the interface for the original Palm-based program that enabled secure wireless money transfers between handhelds. As the product evolved, he effectively designed auction features which solidified PayPal's long term success and is a credited member of two critical auction patents. Chad looks forward to building an empowering video service for the world.

Jawed Karim is a co-founder of YouTube. He was previously a computer science student at the University of Illinois, where he was recruited by Max Levchin to become one of the earliest engineers at PayPal. There hepled the implementation of PayPal's first real-time anti-fraud models for credit card and bank payments, working closely with Roelof Botha. As part of PayPal's Architecture Team (a group of five out of a total of over 100 engineers), he later worked on challenging scalability problems to ensure PayPal's ability to scale to 80 million users and beyond. He is currently a graduate student in computer science at Stanford.

Steve Chen is a co-founder of YouTube. As the Chief Technology Officer for YouTube, he is responsible for leading the engineering efforts in distributed video clusters and meeting the high-availability demands of video. Before YouTube, Steve spent 6 years at PayPal on the technology team. At PayPal, he led the engineering teams behind products such as PayPal China, PayPal Developer XML APIs, and PayPal Shopping Cart.