MEKS

-MekTek Efficient Kaching System-

WESLEY NICOL
Business Plan Competition

Carleton University
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MekTek Solutions
19 Leaver Avenue, Ottawa ON K2E 5P5
(613) 878-4567, meks@mektek.ca
http://www.mektek.ca/

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Executive Summary

Large companies, enterprises, Internet Service Providers, and large institutions spend thousands of dollars on their monthly Internet bandwidth. Much of the data that is downloaded is redundant and already present on their internal network. MekTek Solutions is developing a caching system that will allow its clients to drastically reduce the amount of data they download from the Internet. By leveraging the data in the internal network, our system creates a giant distributed cache that only downloads from the Internet information that cannot be found within the network. For average web traffic, the system can reduce the amount of data downloaded by up to 98%, with the same or better performance. The system is completely parallel and can work above and beyond all existing caching solutions, utilizing the untapped power that lies within large networks.

At this scale of Internet access , based on bandwidth requirements that exceed 5mb/sec, the customer is generally charged on a per Gb basis by their Internet Service Provider. By reducing the bandwidth requirements for its customer, the MEKS saves its customers a considerable margin of their monthly Internet costs.The cost of the MekTek efficient Kaching System (MEKS) to the client is therefore computed based on the money they save on their Internet costs. Each month, the system computes how much it reduced bandwidth for the customer, and calculates the equivalent dollar amount. MekTek then bills for 40% of that amount, and captures revenue from money that would normally go to the client's Internet service provider anyways. In this manner, the out of pocket risk to the customer is minimized, assuring their participation. If the system does nothing for them one month (unlikely!), they owe no money. If it saves them thousands of dollars, they pay us from money they would have been spending anyways. The MEKS will appeal equally to network administrators who are in charge of the flow of Internet traffic in and out of their infrastructure, and to the chief financial officer who is always pleased when savings can be applied to the bottom line of operations costs in the institution. The MEKS maintains a high performance at a reduced cost. Plain and simple, our product will save our clients money.

Carleton University is the logical target for a beachhead, and more specifically, the technology and infrastructure pioneers in the Computer Systems Engineering department. The department faculty and network administrators have shown a keen interest in the successful development of this project and are eager to participate in its testing phases. They have indicated a strong interest in seeing the performance of the product. With these people in the institution onside, contacts are being made in key management areas of Carleton to start working towards a pilot project. MekTek Solutions has been a

supplier of computer equipment to the university in the past, and will be continuing to offer its other products and services as the relationship grows. The management team of MekTek has built a relationship with faculty members and has interested them in the continued research and its prospective benefits for the university. As such, we plan to go after Carleton as our first key customer by continuing to foster that relationship and involve them throughout the development process.

MekTek Solutions has a proven track record of performance and customer excellence with over a hundred customers in the Ottawa area. With the foundation of the company already in place, and the key management team ready to take on the new challenge, all that remains is the proper financing to put the gears in motion. The management team forms an excellent balance of strengths and abilities to see the project through. The hiring of additional staff and recruitment and training of programmers will drive the project at the appropriate stages, while ensuring that the cash flow of the company remains adequate at all times. Furthermore, by aiming for profitability from year one, we avoid the more risky assumptions about product acceptance after lengthy development.

The first year of the operation focuses on building stability, and the development of the MEKS system. By the end of the year, we plan to break even on our costs of development and acquire capital assets for the company. By the end of the second year, we plan to have a net income for the company of nearly $100,000, with a well marketed and respected brand. At the outset of the third year, we aim to reach a bottom line of over $200,000 with the dozens of customers on board with our systems in place. Thought the growth is slow, careful planning, evaluation and decision making will build us a foundation upon which we can finance more successful ventures in the future.

Several years down the road as the interest wanes in the MEKS product due to changes in the nature of business and the Internet, we will have a secure company in the comprehensive IT solutions market that will shift its focus to developing new products that will address new needs. By focusing on MekTek's infrastructure, staffing, financing, marketing, and growth we aim to build not only a successful product, but a business for life, that will continue beyond the life of any one product. As we work on the MEKS systems, we also look ahead and continue to look for needs in our customers to start prepare the next solution once the MEKS falls out of the dynamically changing technological scope of evolving needs.

Business Overview

Business History

MekTek Solutions was founded in 2002 to craft custom solutions to the technical needs of the National Capital Region. Initially the company offered computer hardware, software and consulting services to homes, businesses and institutions in the area. Its reputation for impeccable customer satisfaction, competitive prices and friendly personal service spread quickly as the company thrives off of the word of mouth referrals of its happy customers. Since then, MekTek has built up a large consultant network to offer a broad range of technical services to its customers and has established relationships with high-tech suppliers across the country. With this infrastructure and steady revenue in place, the company is currently expanding its offerings to include one-on-one computer training classes, web development and hosting, and networking solutions for large businesses and enterprises and, of course, the MEKS.

MekTek Solutions was officially registered under the laws of the province of Ontario as a sole proprietorship of Mekki MacAulay Abdelwahab in March of 2003. By July 2005 the company will be incorporated as MekTek Solutions Inc. and Mekki MacAulay Abdelwahab will be sole owner. He will operate the company and focus his energy on day to day activities, management and sales.

Location and Facilities

MekTek Solutions is located in the heart of Canada's National Capital Region. With direct access to extensive government facilities and a wealth of growing businesses, the company has established itself in the fastest growing technological area in the country.

A thorough analysis of key office locations in the city is in progress to ensure that MekTek will have the best flow of resources from its suppliers, the best accessibility for its consultants, and a professional and inviting atmosphere for its current and prospective clients. Highest amongst the prospects are several locations along the city's core transit infrastructure expected to boom in the near future with the City's Rapid Transit Expansion Plan furthering current revitalization. The centralized location offers a balance of transit for east-end and west-end commuters alike without the frustrations or expenses of the downtown core.

The office workspace will expand from its current 500 square feet to over 1000 square feet in a building and property the company will purchase valued at around $200,000. By owning the property MekTek will be building equity that will strengthen the confidence of investors and potential creditors and will offset the expenses associated with long-term office leasing. By carefully selecting the site, purchase overhead costs will be offset by the increase in property value that

will come as a result of introducing a successful business to the area. The office equipment includes desks and furniture for all of its employees and consultants, several workstation and server computers, audio and video devices and artwork suitable for an idea-promoting environment.

The Opportunity

MekTek Solution's flagship product has been affectionately named MEKS, or the MekTek Efficient Kaching System. The MEKS is based on three principles:

1) Large companies, enterprises, institutions, universities, and many other business such as Internet service providers use a lot of Internet bandwidth in the day to day operations of their company.

2) There is a lot of duplication in Internet traffic. Very frequently a large portion of data that is downloaded already exists on the local network and does not need to be downloaded a second time. Even when most of a file already exists on the network, if it is missing a small portion the whole new file is downloaded again, when only the differences are required.

3) Superfluous downloads result in wasted bandwidth, time and productivity, which all translate into wasted money. Companies like to save money!

The MekTek Efficient Kaching System was devised to put together these three principles into a product that will drastically reduce the bandwidth usage of companies. With the system in place, they will save money on the operations costs of Internet bandwidth, capital asset expenditures as there will be no need to purchase caching servers, and staffing costs as all monitoring is done via remote management at MekTek.

The Clients

Any company, institution or enterprise that purchases Internet access based on bandwidth requirements that exceed 5mb/sec is generally charged on a per Gb basis by their Internet Service Provider. This translate every Gb downloaded into direct a expense for the customer. Therefore the MEKS, translates each Gb retrieved from the cache instead of the Internet into direct savings for this market segment. Much of the intended customer base have some form of caching system currently implemented, however, the MEKS ability to cache files ignored by conventional systems and in a more efficient manner results in bandwidth savings in addition to the customer's current system.

For our beachhead customer, Carleton University, and similar institutions, deployment of new technologies is

hierarchal. New technologies are frequently championed by faculty who have an understanding of the underlying technology. The decision makers rely on the professional assessment of the faculty in their evaluation of new products and the validity of the underlying technology in order to make an informed decision whether to implement the product in addition to potential gains of cost reduction and increased operations efficiency. We stand to impress both sides by involving the faculty in the research and development and offering a clear value proposition to the decision makers.

We go after our first customer by involving their faculty and students in the technological development that can be directly related to research interests. As the development of the product approaches completion near the end of the first year, we will invite Carleton University to participate in a pilot program at no cost for the first 3 months, to directly see the benefits of the product and to get their feedback on improvements that can be made. After deployment in this environment, we will use media releases on the success of our product and Carleton's contribution and involvement in its development, to broadcast to other institutions and perk their interest. When we then approach them directly in the following months, they will be primed with a desire to learn more about our product and its benefits to them.

At large companies, our solution appeals primarily to the economic and technical buyer. We offer an innovative solution to network administrators who are focused on the efficiency of their computer infrastructure and want to ensure all the employees of the company have fast, uninterrupted Internet service. The parallel design of our product and efficient solution we apply to the problem of high bandwidth usage will appeal to them. The management will be most interested in the bottom line savings we can offer them. They want to see the most cost effective way to reach a level of service that meets the needs of their organization. The pricing policy is tailored specifically to make them comfortable with implementing our product even if they don't fully understand the technical side. The lack of technical understanding by the customer is often a huge hurdle when trying to sell a new technology. By reducing the risk and providing clear gains, we hope to prevent or alleviate any potential uncertainty.

The Product

The MEKS runs in parallel on existing networks, with minimal modifications to the network architecture required. It works above and beyond all existing caching systems present on that network leveraging their power and maximizing its efficiency.

The MEKS operates by keeping track of all the files inside a network, and when a file is downloaded from the

Internet, it first checks if part or all of that file already exists inside the network. Effectively, the MEKS turns the whole network and every machine on it, into a giant distributed cache system. A traditional cache system would be only at one location with its own pipeline. By distributing it, we inventory all the existing cache locations, and leverage them, but also leverage all the other files on the hard drives of all the machines on the network!

If the complete file is not on the network, the MEKS will build up as much of the required file as possible from existing data in the network, and will only download the differences from the Internet. The system offers a bandwidth usage reduction of up to 98%, which translates into significant savings for our clients. Not only does it translate into bandwidth savings, but it is much faster as well. By serving up the content largely from the local network, we leverage the speed of the LAN, instead of the small Internet pipe.

The technical approach for the MEKS ensures absolutely no risk to the prospective clients. As many companies are very concerned about their networks, the MEKS is entirely parallel, removing any risk of causing harm to their current systems. Simply put, we offer more efficient bandwidth reduction, faster, and at a lower total cost than existing solutions. The system is designed with security and privacy of users in mind, both of which are key where data transmission is concerned.

The Pricing Strategy

The conventional business model for caching systems is an upfront purchase of the system and monthly service fees. This model risks costing more than the actual returns the customer receives from the bandwidth savings. There is no guarantee of how much savings any given system will produce until it is implemented within the specific environment.

The MEKS pricing strategy is simple. If it doesn't do save the client money, they owe us nothing. The system is provided to businesses at no up-front cost. Each time the MEKS is accessed, it keeps track of the savings it has optimized. At the end of each month, it calculates how much money the business saved on their bandwidth costs by using the MEKS and they are billed for 40% of that amount, or the equivalent of 30% of the amount they are currently spending. Customers pay from money they would be spending anyways.

MEKS Pricing Breakdown:

MEKS fees	30%
ISP charges	25%
Client Savings	45%

Intuitively, this approach seems unwise, but with careful consideration, it has to make sense if we are to offer any sort of value to our customers. The current way of doing business is to try to convince customers that our product is really worth all the upfront cost, with no guarantees that it will actually work in their environment. A client would never buy something that didn't add value to them. If the product didn't work as they were told it would when they spent the money on it, the would become very angry and would certainly not recommend the product to their colleagues and friends. If however the product does perform as expected, then by taking a portion of the savings of the client, we're putting ourselves in a position to capture from the upper limit instead of the bottom limit. In the traditional way, if the product did nothing, tough luck for the customer, and the provider still made money. But, if the client saved a lot of money the provider only got the one-time upfront cost, and doesn't continue to benefit. The providers then have to spend large amounts of money on marketing their new and improved systems to try to get a second sale. Our approach not only protects the customer, but guarantees a constant revenue for MekTek. As the customer continues to benefit from our product on the long term, so do we.

The Added Value

Large companies, enterprises and institutions are primarily focused on risk when it comes to implementation of solutions such as the one proposed. To address this concern, the main focus of our added value is the mitigation of risk for our clients. This comes in two forms, both implementation risk, and financial risk. By making our system entirely parallel to their existing network infrastructure, we ensure that they cannot be harmed by implementing our system. Should it fail at any point, all Internet traffic would simply use the normal connection without the added optimizations. By including this at the design stage in our project, we commit to our clients that we want the implementation of our system to be hassle free, and require no maintenance on their part.

We also guarantee a risk free financial position for our clients. We provide the customer with a system which more than pays for itself, directly, with no risk or upfront cost. We offer a revolutionary pricing scheme where the fees are a direct percentage of the customer's actual savings. Furthermore, by gathering statistical usage data we will be able to fine tune the system to each individual customer based on their specific needs thereby increasing the savings. This model eliminates the initial risk and will never cost the customer more than they are saving. This type of negative cost selling is very appealing to companies.

Product Overview

Existing Approach

Currently in the caching market there are two main types of systems, small file caching, and large file caching. Both operate on a similar concept by working with the probability of a file being needed again in the network and storing the most likely files locally such that when they are required again, they can be downloaded from the server cache, instead of the expensive and relatively slow Internet bandwidth. Every time a file is downloaded, the caching servers preserve it for a time in case it will be needed again in the near future. This principle helps reduce the overhead of repeat requests, but does nothing to reduce bandwidth for similar, but marginally different requests. These similar but slightly different requests are becoming more common on dynamically updated sources of information such as web pages, blogs, and product patches. In the present system, as soon as the request is different at all, the entire file must be downloaded again.

Furthermore, the cache size and location is limited to the server on which the system is deployed. The cache can

only be accessed by the single direct connection to the machine, resulting in pipelining issues, and the cache can only grow as big as the hard drive space on the caching server. Any extra files that might regularly be accessed but do not fit in the allocated space, are discarded and their optimizations lost.

MEKS Technology

The MEKS is being designed with two key goals in mind. First, it is designed to decentralize the focus of the cache in the network by distributing the access load and file storage across every machine in the network. To do this, it runs a background process on the network, comparable to fast-find indexing for Windows NT file searches across a network, that inventories every single file available on every computer on the network, and generates a unique checksum to identify the files, and the strings of bytes of which they are made. When a request to download a file from the Internet is received by the MEKS, it does a rapid check through its index of chunks of files available on the local network, and builds up the file from those data sources instead of using expensive Internet bandwidth.

The second key goal recognizes that frequently files that are downloaded are very similar to previously downloaded files, but not exactly the same. Existing caching systems simply download the whole new file, at full bandwidth utilization. But, the MEKS instead uses its index of file chunks to build up as much of the file it can from similar files available on the network, and then only downloads the difference of the new file from the Internet. In the case of standard web requests such as the New York Times, or CNN.com, the difference is in the order of 98% smaller than the whole file!

The field of delta compression grew in popularity as the Internet exploded after 1996. Dr. Andrew Tridgell, of the Australian National University did his thesis work on efficient algorithms for sorting of data, and the notion of a rolling checksum, a set of polynomials that have a specific property that allows them to compute a checksum at a specified offset from the current one with minimal computational overhead, became well known. The MEKS file checksum generating and recombining facilities use a similar form of checksums, modified to handle binary data just as efficiently as text data.

Professor Trevor Pearce of the Computer Systems Engineering department at Carleton University is quoted as saying “This technology is for real!” in a recent discussion on the possible technological impact of the implementation of the MEKS. The owner and technical manager of MekTek have been conducting research on a delta algorithms and their applications throughout the past year and have made several advances already. Although the fine tuning of the algorithm to handle binary and textual data concurrently will be non-trivial, it is definitely possible, and we have projected for a sufficient

amount of research and development time to see it through.

The most convenient feature of the MEKS is its fine tuning abilities. Every client will have a different type of data usage. Some will download more text. Others will download more binary files. Yet more will be using their connections for video and other applications. Certain algorithms respond better to certain traffic. The MEKS system maintains comprehensive statistics of all traffic that goes through it, and by the third month of usage, it will be able to suggest optimizations that will fit specifically to the type of data the particular customer accesses most frequently. All the servers are remotely monitored and managed at the MekTek headquarters. A simple update to the delta generation algorithm every month will fine tune the bandwidth savings.

Market Analysis and Marketing Strategy

Product Segment and Target Market

The bandwidth reduction market in North America consists primarily of standard caching systems. As developers approach the limits of standard solutions, new solutions are slowly appearing that take a different approach to the problem. As the MEKS is specifically designed to inter-operate with existing standard caching systems, and to offer a new approach to bandwidth reduction, it will be competing in the newly emerging market. The majority of this portion of the market is focused on reducing the upload bandwidth for websites that host blogs. Up to the present time, the client-side bandwidth reduction market has stayed with standard solutions. This decision is primarily due to the fact that until recently, there was no efficient way of dealing with different types of files, so an all or nothing approach was the best way of doing things. With media content on the Internet becoming more prominent, and usage trends changing on a regular basis, a new approach from the ground up that considers these factors is needed.

The caching market is divided roughly into four major segments: Internet service providers, large businesses and enterprises, universities and large institutions, and consumers. Traditionally, consumers purchase through Internet service providers and pay a static amount for a certain quality of service. If they exceed their allocated bandwidth, they occasionally pay a penalty per Gb downloaded, but this only accounts for a small portion of the consumer market.

Prospective users of the MekTek Efficient Kaching System can be grouped into one of 3 major categories: universities and educational institutions; large businesses and enterprises; and, Internet service providers. The largest

market segment is clearly the large businesses and enterprises, while universities are likely the most approachable. In addition, though there are fewer universities, they use drastically more bandwidth than any large business, and hence are potentially a more profitable customer.

Businesses and enterprises rely on the efficient flow of bandwidth for their day-to-day operations in developing and providing their products to their customers. They are not likely to cut back on their bandwidth even if it becomes expensive as it is too essential to their operations. They will welcome an opportunity to reduce cost that won't impact on their operations.

Universities and other educational institutions are frequently restricted by their funding from the federal and provincial governments. Reducing operations costs is frequently a key concern. In addition, given the predominance of pioneers in technical fields present in these institutions, they are most likely to be willing to adopt an emerging technology, especially if it can alleviate some of its financial burdens.

Internet service providers resell bandwidth to their customers, usually at a flat rate. They lose money when their customers exceed the expected bandwidth usage, and end up paying stiff penalties to their providers for the increased service. The implementation of an efficient caching system is key to their bottom line and directly impacts the modeling of their pricing scheme for the service they offer to their customers. By implementing our product, they can gain a competitive pricing edge over their competitors.

Our present major focus is on Universities and will progress to businesses. The initial test market is the National Capital area which has four universities and several colleges.

Industry Trends

For the past 6 years several factors have contributed to an increased Internet bandwidth usage in North America. Computer complexity and processing power has increased according to Moore's Law. Processing power has doubled roughly every 18 months, and shows no signs of slowing. The average desktop computer today is more powerful than a computer that filled a server closet ten years ago. With this power, developers have been creating more and more complex, faster and comprehensive programs. Most modern programs are now released earlier in their development cycle, with a promise of future upgrades and patches being available for download on the Internet. Frequently, these patches and downloads can be 10% or more of the program size as it is shipped on CD. These same patches are often downloaded over

and over in the same network at a huge cost.

The rapid deployment of high-speed Internet connections across North America has helped make bandwidth more widely available, and transactions across the major backbone servers have drastically increased as a result.

As processing power has increased, the cost of data storage has decreased. Consumer hard drive prices continue to drop drastically and are now below one dollar per Gb. With more space to store files and with high-speed connections more readily available, digital media (photography, movies, music) have surged in popularity. As more space becomes available and more bandwidth can be used, the resolution and length and hence file size of this digital media continues to grow.

With all these factors combined, the bandwidth usage in North America is the highest it has ever been, and is continuing to expand for the foreseeable future. Although costs are dropping at the consumer level, they remain the same for our target market segment who have to bear the brunt of the increased costs. As such, they welcome prospective alternatives.

Pricing Strategy

The MekTek Efficient Kaching System's pricing policy has two aims:

1) Minimize the risk of adoption of our solution for prospective customers.

2) Guarantee a constant revenue stream to MekTek Solutions using the "The harder you work, the more money you make." principle.

To penetrate the market, MekTek will be implementing the MEKS systems at no upfront cost into the client's infrastructure. The system will keep track of the bandwidth savings it optimizes each month for the client, based on its per Gb costs. This pricing scheme guarantees that customers not only get an amazing deal, but that the better we track and refine the MEKS implementations to offer better savings to our clients and the more systems we deploy, the more revenue we get.

The competition typically charges an upfront cost for a server, and a monthly maintenance fee for the software that tracks and optimizes the savings. Their pricing is based on their reputation and industry reviews of the performance of their systems, as opposed to the actual gains the customer receives. These systems are very expensive to implement and do not offer any guarantees to work in a particular environment.

Promotion Strategy

MekTek is focusing its initial marketing energies on Carleton University as its first key customer. By involving them in the development process, we are able to refine a product that best addresses their concerns and needs. Interacting with them throughout the development gives the big advantage of seeing things from a customer's perspective, and allows us to make mid-course corrections as necessary. Once we have secured them as a key customer, promotion and pricing can be geared towards emphasizing the benefits Carleton has already received as a case study into the effectiveness of our product.

The MEKS has a very clear value proposition. The primary promotional strategy is getting the idea into the mind of prospective clients. The best way of doing this is two-fold. First, we market through industry-specific publications to get a lead. IT World Canada has a bi-weekly national publication called Network World. It frequently features full page colour ads from companies such as IBM, Microsoft, Computer Associates, and many others. We picture a full page ad that features a nice background with the pitch:
"Want to reduce your bandwidth usage by over 50% at no up-front cost? Don't think it can be done? Let us prove you wrong: www.mektek.ca/meks/"

It is cheesy, but a quick glance at an issue of Network World will demonstrate that this is an effective marketing strategy that companies have been using in industry publications. It is not technical at all, but it gets the point across. It suffices to get the client's interest perked and have them contact us for more information. We then organize a face to face meeting where we can take a look at their facilities and infrastructure. The size of this product and its potential impact on the operations of our clients necessitates the face to face interaction during the sales process. In this manner we can directly address the concerns and questions of our clients that no marketing literature, no matter how well crafted, could ever do on its own.

The Ottawa Center for Research and Innovation has regular trade shows and events that suit perfectly for the promotion of this product and to expose the industry to its innovative proposition. The technology conferences will raise awareness of the product we offer in our target market and will generate leads to follow up on. MekTek will also continue with its strategic partnerships that will result in promotion of our product by our partners alongside their products.

Competition

Key Competitors

While the MEKS system can interoperate with existing systems to offer additional increased savings, there will be many other standard caching systems on the market that will be attempting to take a share of the market. Ideally, we would like to form strategic partnerships with some of them (such as Ankora Technologies). As their initial response is likely to perceive MEKS as competition, it may be a challenge to convince them that our solutions may compliment one another, increasing the marketability of both.

The majority of our competitors have a focus on the American market and tend to ignore Canada, even at Silicon Valley North. They combine their caching systems with their other product and service offerings to leverage their well established brands. Frequently they partner with systems integrators who then promote their solutions to their customers. These companies focus primarily on business and enterprise clients.

Value Added Services

The main advantage we have over all competitors is our pricing scheme. The large players such as IBM, Dell, Lucent and Microsoft all offer systems that attempt to give the best performance per $1000 of the cost of their systems. As they compete with one another, we will be offering a wholly different pricing scheme with the benefits to the customer made clear.

By focusing on creating a complete solution for MEKS customers, we can leverage the best of the software and hardware market, without losing our focus. While the previously mentioned companies offer servers in the range of $3000-$65000, our servers will be produced at less than $500 per unit, with at worst the same performance as theirs, and at best, a drastic improvement. We are able to reduce the cost drastically by eliminating the need for expensive hard drive space by distributing the cache across the network, and eliminating the need for expensive redundant network cards, by distributing the load and minimizing the external requests required. We can also reduce it further by using MekTek's existing hardware distributors to order the components directly from the factory, and integrate them together into a cost-effective solution.

Additionally, the majority of the market focuses on business and enterprise clients. Given our connections to the education providers in the National Capital Region, our deployment into their places of operation will be more readily accepted than solutions that are not tailored for their market segment.

Even at the level of straight comparison of products, the MEKS servers pull out ahead by a significant margin.

Looking across all the currently available servers, the best ones from IBM, Compaq, Dell, and Microsoft boast bandwidth savings of up to 55% on their highest end servers that cost up to $65000!

The MEKS has a worst case scenario offering of 54% savings when implemented in an infrastructure with no current caching system, and given the right traffic, in some environments it could offer up to a 98% bandwidth savings, all at no up-front cost to the customer! Best yet, it can be implemented on top of any of these existing servers to dynamically increase their effectiveness.

Management and Staffing

Organizational Structure

MekTek Solutions is built around a core of three full time people and a network of part-time consultants. The day-to-day operations are overseen by the President, Technical Manager and Logistics Manager who direct the consultants and interact with the customers.

Eight part time consultants handle additional hourly client service requests, Tek O.S. courses, and the assembly of MekTek Workstations and Computers. The consultants are assigned work on a training, seniority and availability basis. New consultants are continually incorporated into MekTek to help build up the technical skill set that we offer to our clients.

MekTek is making use of the resources of Carleton University Career Services to begin recruiting the best emerging young talent and intends to seek government funding to hire co-op students and clerical staff at subsidized wages to reduce overhead. Up to $36,000 in government funding per year will be applied to wages, though we only include an assumption of $12,000 per year in our financial projections as a safety margin.

Management Team

Mekki MacAulay Abdelwahab is President of MekTek Solutions, and sole owner. He is a graduate of Computer Systems Engineering at Carleton University, and has several years of experience with high-tech companies. His studies in business and psychology have complimented his engineering background to prepare him for the challenges of leading a successful company.

The President manages the company and ultimately makes all executive, administrative, marketing, planning,

financial, and technical decisions for the company based on input and experiences of his employees and consultants. He is directly responsible for the success or failure of the company and strives to maintain an environment that promotes the linking of innovative solutions to customer needs.

The President is assisted by Sarah Gelbard, Logistics manager, who oversees the day-to-day undertakings, marketing strategy, and product inception. She also takes care of graphics design and consulting (http://www.mektek.ca/graphyx/). She is a graduate of the School of Architecture at Carleton University. She is highly organized and talented in planning, design, and visualization.

Benjamin Zanin is Technical manager and focuses on the technical development of products, including the MEKS system. He is pursuing his education in Computer Science at Carleton University and has broad industry and government experience. He is key in developing training courses, troubleshooting and technical resolution for customers, and a key consultant in a broad variety of industry tools. The Technical manager heads the programming and research staff that will be hired as the MEKS development phases advance.

As a part of their benefit packages, all management team members will be sponsored to take courses at Carleton University to pursue advanced degrees as they continue their employment tenure with MekTek..

Staffing

The development of the MEKS system calls for the hiring of two programmers, one initially and one following implementation, who will report directly to the Technical Manager. They must be proficient in Java and C++ object oriented programming, and preferably have experience working in a business setting with project time lines. They will be hired through Carleton University Career services, and will likely be first year through third year computer systems or computer science students. They will be paid a nominal wage of $12-$16 per hour based on their experience, plus industry standard benefits. They will be trained by the Technical Manager on MekTek coding practices and will be invited to participate in the MekTek Consultant training such that they might be able to offer consulting services in the future.

The consulting needs of the company are taken care of by several individuals who have had professional relationships with the owner and technical manager in their work and education experiences over the past few years. Consultants are added to the team on a recommendation basis. Their abilities are assessed and noted, and they are assigned to consulting requests that fit their technical knowledge. The consultants are free to assist in the development of courses,

and are invited to refine and expand their technical knowledge to bolster the MekTek portfolio. Consultants are paid $20-$30 per billed hour, based on their education, seniority within the company and referral of business.

Regulatory Issues

Intellectual Property Protection

All code created by MekTek programmers will be immediately protected under copyright laws. MekTek has a comprehensive policy on trade secrets and non-disclosure for its employees. Some portions of the code we develop will be based on open-source programs which are licensed for commercial use. Although such code is immediately available to our competitors, it is the creative combination of this code that our company is leveraging, and this is the pivotal point of the work that will be protected.

In the current legal atmosphere of North America, a frequently used adage is: "If you are successful, you will be sued". We, of course plan on being successful, and hence expect to be challenged. The time and money required to fight in court will be well beyond our means if a large company chooses to prolong the process and hence no amount of patents or intellectual property protection will be able to shield us in the event they put us in their sights.

Instead, we are using the "First to market" principle to ensure that should a larger competitor get wind of our work, and attempt to duplicate it, by the time they complete the work and release it, we will have penetrated the market to a sufficient extent that we can withstand them on brand awareness. Furthermore, the intellectual property we will be developing will be very valuable as it will tie together all the disperate pieces into a coherent product. Reproducing it will be no trivial task.

The MekTek name, and spin-offs on the name are already a recognized brand in the Ottawa area. All MekTek products will be named in a similar fashion to tie them to the MekTek reputation of excellence. All logos and slogans will be trademarked to ensure our competition cannot use them to confuse customers.

Operations Plan

Implementation Description

In order to deploy the MEKS, we start first on the foundation of Mektek Solutions and expand our existing products and services to finance the venture. By using internal revenue instead of investors, not only do we keep ownership of the company but we keep control of key decisions. Profitability becomes a very personal responsibility. It is a huge motivational force. The key stages of implementation are:

- Establish Business Structure
- Provide Physical Facilities
- Establish Management Team
- Product Development
- Product Pilot
- Product Commercialization and Review

Implementation Activities and Dates

The management team has formulated a project implementation plan for the development, marketing, testing, revision and deployment of the MEKS servers in the National Capital Area. It is detailed in the work flow of Schedule 1.

Risk Assessment

Our primary customers, namely universities, feature a lull of activity during their summer months when the majority of students are no longer on campus. During this time, their bandwidth usage will drop drastically, producing lower revenues for those months. We have factored in these revenue adjustments in our financial projections to ensure that even during the summer period, the MekTek cash flow will remain stable.

It is possible, though unlikely, that another major company may wish to copy the MEKS system, and deploy a similar one using their greater resources. In the event this occurs, which we project to be a less than 10% probability in the next three to five years, MekTek is relying on its first to market penetration and agreements with its existing customers to hold its position. Even in a worse case scenario where we were then unable to secure new customers who went to larger company's system, we would still have a constant revenue from the systems we have already implemented, and will have a penetration in the market via our strategic partnerships with affiliate companies.

The MekTek company structure is highly dependent on three key individuals, namely the owner, the logistics

manager and the technical manager. In the unlikely event that any of these people became unable to work, the company pursuits would be severely hampered. As the value of MekTek grows, options for insurance against the loss of key people will be considered.

Another key risk is that large organizations frequently refuse to buy from small companies, especially when it comes to emerging technology. The best way to address this is to sell to established systems integrators who will use our product as part of a total solution for their large customers. Once we have established our key first customer in Carleton University, and we begin to focus on acquiring the next key clients, we will also look towards systems integrators to assess their interest in licensing our solution if we find we are unable to allay the concerns of the big companies by virtue of our size. If we find that integrators are more willing to try our solution, then our drop in direct revenue from the fewer direct clients will be offset by the lower direct marketing and implementation expenses that the integrators will take care of, maintaining the profitability of our company.

Financial Plan

Sources of Funding

The development stages of the MEKS will be financed primarily by MekTek Solutions' existing operations, including hardware sales, and consulting, as an investment towards the company's future. With its infrastructure and steady revenue in place, the company is currently expanding into product development with the MEKS. By using internal revenue to finance the venture instead of investors, ownership of the company and control of key decisions are maintained. Profitability becomes a very personal responsibility and a huge motivational force. Furthermore, notable support will be provided by Federal Research and Development tax credit programs and government subsidies for co-op students and other employment and small business programs.

Key Assumptions

They key factor for the financial projections of our plan is the cost per Gb downloaded ratio. Magma Internet service provider offers packages with fixed maximum download quantities at 20 Gbs or 100 Gbs per month, and bill at $10 per Gb after that amount. However, given how much large institutions use in bandwidth, it is assumed that they negotiate special deals with providers to get the service at a reasonable cost. Given the nature of these services, large Internet service

providers do not publish their prices as the deals are negotiated on a case-by-case basis. For our purposes, we will assume a fairly conservative number of $0.20 per Gb downloaded on average. The actual cost will fluctuate up and down month to month based on usage trends, but on a yearly basis should remain relatively stable for any given institution. (See the sensitivity analysis for a discussion of worst-case scenario for profitability.) We also assume a usage comparable to Carleton University's 63,000 Gbs per month downloaded as being an average usage for our target customer base. Actual usage will be higher or lower based on the specifics of the companies and their trends. Within three months of deployment in any particular company, enough statistical data will be gathered on their usage to fine tune the system to offer better savings that should mitigate any discrepancies. Research with several large ISP's in North America has confirmed that these numbers are in the right margin for how much they offer to their customers, though the way they organize the pricing structure is not as conducive to the calculations we make.

We project our new client acquisition to be one client per month, based on the size of the institutions and the marketing required to get a new client. By adding one customer per month, and sustaining previous customers, we grow slowly, but steadily.

Projected Net Income

The main focus of the first year is geared at being profitable from day one. It is always a challenge to get a company off the ground in a new pursuit without falling deeply in the hole. In the first year, we do four key things: we secure financing, purchase and tailor the headquarters of MekTek, bolster existing sales of hardware and consulting services, and develop the MEKS system. By the end of the year, with careful planning, we manage to keep our net income positive, and fund all of the MEKS development costs from our own resources.

Our second year uses the resources from the MEKS deployment to bolster operations, sales and marketing, and hire more staff to take care of the increasing work load. With a sales team in place, and the focus of the company now on its flagship product, we are able to steadily grow to a much more comfortable net income. We aim for a sizable growth growth in sales, with the combined existing MekTek products, and the MEKS bringing in over 1 million dollars in gross sales. At first glance, that number seems exceptionally high, but, the secret lies in the constant revenue model of the MEKS pricing scheme. While our competitors spend all their marketing efforts towards getting a single, upfront sale, we get onside with the client, and become a partner in their savings with our product. We aim for adding one customer per month, which allows

us to spend considerable time geared towards that single target, until they have signed on. From that point forward, we receive a constant revenue, each month, from this customer, combined with the revenue of all the previous customers. At a projected average of $2000 per month per customer, by the end of year two, with only 15 customers, we are able to meet that impressive sales figure.

By the end of year three, with over two dozen key customers in place, and a stable operation and marketing strategy, the net income grows appreciably and puts us in a position to pay off all the loans and out of pocket bootstrapped expenses that went in to the company at the early stages. At this point we begin to see a level of income that can be used to support the next MekTek product development phase, and growth the company further.

Projected Balance Sheet

The balance sheets demonstrate our comprehensive plan at building the structure of the company. In the first year we make a large investment of $180,000 into property to house the MekTek headquarters,, using funds from the government small business loan program as a mortgage.. The net retained earnings suffer for the first year as we take care of the development of the MEKS system. Given the dedication of the owner, there is a substantial paid-in capital from his salary invested back into the company in each year, which works to promote a positive cash flow. By the end of the second year, with the strong MEKS revenue in place above and beyond the previous year's income, the owner's equity builds significantly to nearly $275,000. Finally, by the end of our projections, the strong revenue from the large customer base enables us to pay off the mortgage loan and drastically build the owner's equity to over $600,000. At this stage we have built up a comfortable base of fixed assets for the operation of the company and have taken care of all the initial investments while giving a strong return to the owner. These funds will be used to develop, promote and launch new products under the MekTek brand in the years to come, promoting the long term success of the company

Projected Cash Flow

With careful planning, we have developed a cash flow plan that allows us to attain all of our goals with a comfortable margin to deal with unforeseen problems. We open with a term loan mortgage with an assumed rate of interest of 5% per year. We immediately purchase the MekTek headquarters property and building, and apply the bootstrapped capital to get the operation running. The owner makes a substantial investment into the company in the first month, and

continues to invest money into the company by working for free. This investment is paid back in the second and third years of the company when the cash flow is more comfortable.

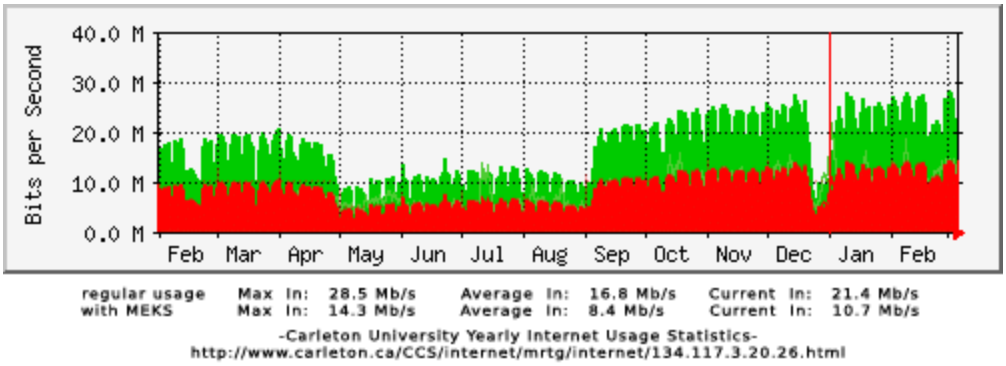
The term loan is steadily decreased through principal and interest payments each month and is wholly paid off in the third year, when the MEKS project is in full swing and generating considerable returns. The wages of the new hires, including the technical manager, are to be subsidized by the Federal Government's Industrial Research Assistance Program, and the Science and Technology Youth Internship Program, with support of up to $36,000 for three positions. Given the challenges involved in getting such loans, we've assumed a conservative rate of support of $12,000 per year in our cash flow statements. Any excess would be directly applied to the reported wages and benefits. Additionally, the Federal Government's Scientific Research and Experimental Development tax credit program will support a portion of the development staff and overhead costs for the company at the end of each fiscal year. Given support varies depending on the activities each year, we've estimated a conservative support amount of around $12,000 per year. In the development of key activities for the product, steps will be taken to stay within the eligibility criteria of this program.

Given the marginal net income of the first year, income tax is assumed to be zero or negligible. For the second and third year, we make an assumption of a 33% tax rate on the net income based on a rough estimate of tax credits and exemptions. The second and third years see a large spike in marketing and operations expenses as expected for a mature company with a flagship product, primarily to support our existing customer network, and build the brand. Sales commissions for signing on new customers grow as we deploy MEKS servers, and our cash position grows to reflect our success. In principal, this large cash balance will of course not be sitting around idle, and will be re-invested into the company in new projects and expansions, but these future projects are not considered in the flow so as to not dilute the very powerful impact of the prospective success of the MEKS product.

Sensitivity Analysis

For the projection of income from the MEKS, we have assumed four factors: $0.10 per Gb downloaded cost, average download of 60000 Gb per month, average savings of 75%, and a 40% of savings billed to customer. These factors can fluctuate to a considerable degree and still result in profitability for the company. So long as the ratio between them remains approximately stable, we're in the clear. According to a recent quote, Magma Internet bills its Internet at around $10-$15 per Gb for its large scale service, not including installation costs which start at $3000. Our estimate of $0.10 per

Gb is very conservative, and we could comfortably halve it again, and still maintain a positive cash flow and reasonable net income. Carleton University's download rate of 60000Gb/month was very close to that of Waterloo, and other Universities we surveyed.



An Ottawa area large enterprise, which asked that we not disclose its name, reported a bandwidth usage approximately half that of these Universities, but well within the profitability margin. We projected an average bandwidth reduction of 75% based on early estimates on the statistics gathered on the effectiveness of the MEKS system. It's worse-case scenario gains are 54%, and its best possible gains, given the right traffic, exceed 98%. A comfortable range exists in between where our pricing scheme is effective. Finally, based on a preliminary market assessment, we assumed that customers would be willing to pay 40% of their savings. It is possible that in fact customers might be willing to pay as much as 80% of their savings, given that it is money they wouldn't have otherwise. However in a conservative dip of the market this rate could drop to as low as 15% before we have to consider changing our pricing structure. Once the MEKS systems are implemented, their upkeep costs are minimal and as such any revenue margin that accrues from having them in place goes practically straight to the bottom line. If any one of these key factors fluctuates, adjustments can be made to temporarily compensate until they return to expected values. Should the rate of one new customer per month drop, we can depend on the revenue from existing customers, which continues to come in until we can secure more customers. If the price per gigabyte goes down, we can adjust our pricing policy to capture a higher percentage of the savings. Even in a worse case scenario, should all of the above factors collapse at once, the interoperable nature of our product would allow us to license it as part of an existing caching solution, and sell it via proven traditional channels.

Certain key milestones have to be reached to keep this project on track. First, we must secure a headquarters for MekTek. Without a place of business, there rest of the plan cannot continue. Thankfully the business real-estate in Ottawa

is overflowing presently with buildings for lease or sale, leaving no shortage of options should one fall through.

At the ninth month of the plan, cash flow gets rather tight as the development of the MEKS completes and deployment begins. Should development be delayed for unplanned reasons, we might be tight for cash at that period until the revenue from the launch clients comes in. To deal with this we are in the process of applying for a small business line of credit under the Federal Government's Small Business Loan program. This loan can be drawn upon when our cash flow from net sales is not enough to cover our development and other expenses, and will be repaid as soon as the receivables come in.

Finally, the management team of MekTek Solutions is key to the success of the plan. Without the right people in the right places, we cannot go forward. To ensure their continued participation in the company, we have offered a scholastic sponsorship program for them to continue their education and finish their degree, or start an advanced degree while they work at MekTek. This program goes above and beyond the standard benefits package that most companies offer, and helps foster a lifelong learning program for MekTek employees. In the advent that we lose key people, we maintain a list of resumes and contacts in the industry such that a suitable replacement to take over the project can be found within the shortest delay possible.

MekTek Solutions
3-Year Projected Income Statement

	Year 1	Year 2	Year 3
Net Sales:			
MEKS	$72,000	$300,000	$600,000
Other MekTek Sales	513,500	737,500	737,500
Total Net Sales	$585,500	$1,037,500	$1,337,500
Direct Cost of Sales:			
MEKS server and install	3,600	7,200	8,400
Sales Commission	0	12,000	12,000
Other MekTek Sales Costs	349,350	385,000	425,000
Total Cost of Sales	$352,950	$404,200	$445,400
Gross Margin:	$232,550	$633,300	$892,100
Gross Margin Percentage	40%	61%	67%
Net Profit Margin	2%	9%	15%
Expenses:			
Sales & Marketing	3,000	45,000	60,000
Property & Utilities	8,720	10,000	10,500
Operations	7,115	20,000	25,000
Banking & Other	2,800	3,600	3,600
MEKS Wages	53,200	84,500	84,500
Other MekTek Wages	58,160	183,000	224,000
Management Salaries	80,000	140,000	160,000
Interest Paid on Mortgage	7,800	7,500	7,500
Depreciation	2,000	4,000	6,000
Total Expenses	$222,795	$497,600	$581,100
Net Income Before Taxes	$9,755	$135,700	$311,000
Less: Income Taxes	0	$45,000	$108,000
Net Income	**$9,755**	**$90,700**	**$203,000**

MekTek Solutions
3-Year Projected Balance Sheet

	Year 0	Year 1	Year 2	Year 3
ASSETS				
Current Assets:				
Cash	0	67,856	276,476	466,676
Inventory	4,000	4,000	4,000	4,000
Total Current Assets	$4,000	$71,856	$280,476	$470,676
Fixed Assets:				
Fixed Assets	500	180,500	185,500	190,500
Accumulated Depreciation	100	2,100	6,100	12,100
Total Fixed Assets	$600	$182,600	$191,600	$202,600
TOTAL ASSETS	**$4,600**	**$254,456**	**$472,076**	**$673,276**
LIABILITIES & OWNER'S EQUITY				
Liabilities:				
Term Loans & Mortgages	0	152,620	144,940	0
Total Liabilities	$0	$152,620	$144,940	$0
Owner's Equity:				
Paid-in Capital	0	125,500	225,500	325,500
Retained Earnings	6,600	-23,664	101,636	347,776
Total Owner's Equity	$0	$101,836	$327,136	$673,276
TOTAL LIABILITIES & OWNER'S EQUITY	**$6,600**	**$254,456**	**$472,076**	**$673,276**

MekTek Projected Cashflow

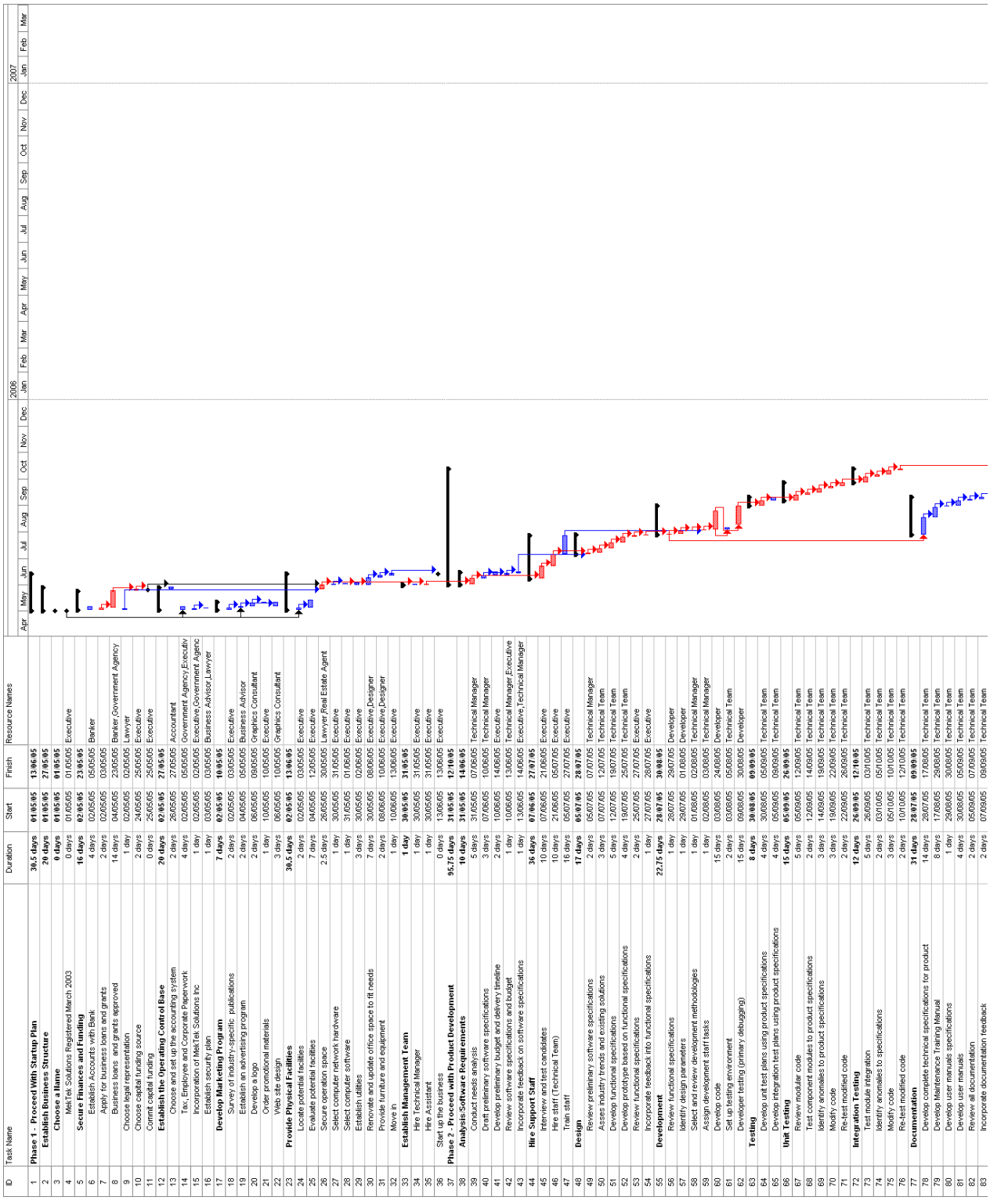
Year 1, monthly

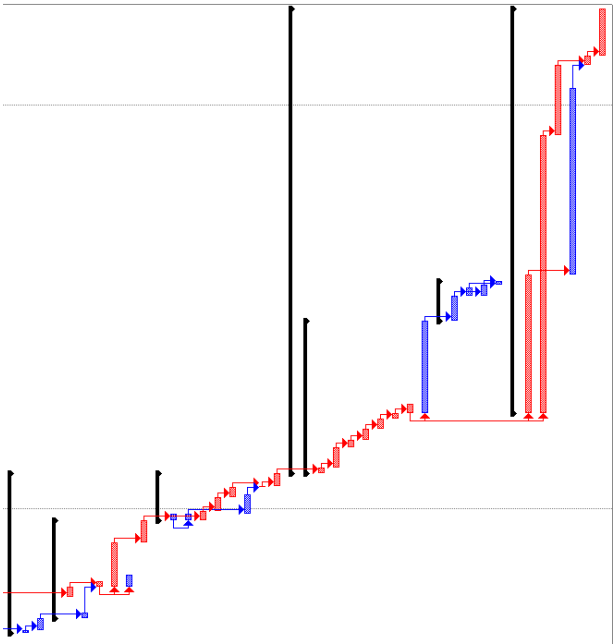
Years 1-3, total

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Year 1	Year 2	Year 3
Cash Inflows:															
Cash Receipts	10,212	12,609	15,900	19,890	23,762	29,937	36,906	46,406	64,672	80,271	89,689	101,227	**531,481**	**1,037,500**	**1,337,500**
Other Sources of Funding:															
Owner Investment	54,000	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	**125,500**	**100,000**	**100,000**
Term Loan Advances(mortgage)	160,000	0	0	0	0	0	0	0	0	0	0	0	**160,000**	**0**	**0**
Other Assets	0	0	12,000	0	0	0	0	0	0	0	0	0	**12,000**	**26,600**	**30,700**
Total Cash Inflows	$224,212	$19,109	$34,400	$26,390	$30,262	$36,437	$43,406	$52,906	$71,172	$86,771	$96,189	$107,727	**$828,981**	**$1,164,100**	**$1,468,200**
Cash Outflows:															
Payment Of:															
Cost of Sales Items	10,200	10,200	12,750	15,300	17,850	22,950	28,050	35,700	45,150	51,600	51,600	51,600	**352,950**	**404,200**	**445,400**
Sales & Marketing Items	500	100	100	100	100	100	100	1,000	500	200	100	100	**3,000**	**45,000**	**60,000**
Operations Items	500	300	300	910	375	600	485	650	460	1,035	500	1,000	**7,115**	**20,000**	**25,000**
Property & Utilities Items	385	520	385	520	375	500	435	720	585	720	2,935	640	**8,720**	**10,000**	**10,500**
Banking & Other Items	1,050	50	50	50	50	50	50	50	50	50	50	1,250	**2,800**	**3,600**	**3,600**
Other Wages & Benefits Items	520	4,680	6,740	7,000	8,160	8,580	10,660	11,240	12,680	13,200	13,700	14,200	**111,360**	**267,500**	**308,500**
Management Salaries	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500	8,500	**80,000**	**140,000**	**160,000**
Estimated Tax	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**45,000**	**108,000**
Other Uses of Funding:															
Term Loan Interest & Principal	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	1,265	**15,180**	**15,180**	**152,000**
Purchase of Fixed Assets	180,000	0	0	0	0	0	0	0	0	0	0	0	**180,000**	**5,000**	**5,000**
Total Cash Outflows:	$200,920	$23,615	$28,090	$31,645	$34,675	$40,545	$47,545	$57,125	$67,190	$74,570	$76,650	$78,555	**$761,125**	**$955,480**	**$1,278,000**
Increase/Decrease in Cash	$23,292	-$4,506	$6,310	-$5,255	-$4,413	-$4,108	-$4,139	-$4,219	$3,982	$12,201	$19,539	$29,172	**$67,856**	**$208,620**	**$190,200**
Beginning Cash Balance	0	23,292	18,786	25,096	19,841	15,428	11,320	7,181	2,962	6,944	19,145	38,684	**0**	**67,856**	**276,476**
Closing Cash Balance	$23,292	$18,786	$25,096	$19,841	$15,428	$11,320	$7,181	$2,962	$6,944	$19,145	$38,684	$67,856	**$67,856**	**$276,476**	**$466,676**

MEKS Implementation Tasks and Schedule

ID	Task Name	Duration	Start	Finish	Resource Names
1	**Phase 1 - Proceed With Startup Plan**	**38.5 days**	**01/05/05**	**13/06/05**	
2	**Establish Business Structure**	**20 days**	**01/05/05**	**27/05/05**	
3	**Choose a Name**	**0 days**	**01/05/05**	**01/05/05**	
4	MekTek Solutions Registered March 2003	0 days	01/05/05	01/05/05	Executive
5	**Secure Finances and Funding**	**15 days**	**02/05/05**	**23/05/05**	
6	Establish Accounts with Bank	4 days	02/05/05	05/05/05	Banker
7	Apply for business loans and grants	2 days	02/05/05	03/05/05	
8	Business loans and grants approved	14 days	04/05/05	23/05/05	Banker,Government Agency
9	Choose legal representation	1 day	02/05/05	02/05/05	Lawyer
10	Choose capital funding source	2 days	24/05/05	25/05/05	Executive
11	Commit capital funding	0 days	25/05/05	25/05/05	Executive
12	**Establish the Operating Control Base**	**20 days**	**02/05/05**	**27/05/05**	
13	Choose and set up the accounting system	2 days	26/05/05	27/05/05	Accountant
14	Tax, Employee and Corporate Paperwork	4 days	02/05/05	05/05/05	Government Agency,Executiv
15	Incorporation of MekTek Solutions Inc	1 day	02/05/05	02/05/05	Executive,Government Agenc
16	Establish security plan	1 day	03/05/05	03/05/05	Business Advisor,Lawyer
17	**Develop Marketing Program**	**7 days**	**02/05/05**	**10/05/05**	
18	Survey of industry-specific publications	2 days	02/05/05	03/05/05	Executive
19	Establish an advertising program	2 days	04/05/05	05/05/05	Business Advisor
20	Develop a logo	2 days	06/05/05	09/05/05	Graphics Consultant
21	Order promotional materials	1 day	10/05/05	10/05/05	Executive
22	Web site design	3 days	06/05/05	10/05/05	Graphics Consultant
23	**Provide Physical Facilities**	**30.5 days**	**02/05/05**	**13/06/05**	
24	Locate potential facilities	2 days	02/05/05	03/05/05	Executive
25	Evaluate potential facilities	7 days	04/05/05	12/05/05	Executive
26	Secure operation space	2.5 days	25/05/05	30/05/05	Lawyer,Real Estate Agent
27	Select computer network hardware	1 day	30/05/05	31/05/05	Executive
28	Select computer software	1 day	31/05/05	01/06/05	Executive
29	Establish utilities	3 days	30/05/05	02/06/05	Executive
30	Renovate and update office space to fit needs	7 days	30/05/05	08/06/05	Executive,Designer
31	Provide furniture and equipment	2 days	08/06/05	10/06/05	Executive,Designer
32	Move in	1 day	10/06/05	13/06/05	Executive
33	**Establish Management Team**	**1 day**	**30/05/05**	**31/05/05**	
34	Hire Technical Manager	1 day	30/05/05	31/05/05	Executive
35	Hire Assistant	1 day	30/05/05	31/05/05	Executive
36	Start up the business	0 day	13/06/05	13/06/05	Executive
37	**Phase 2 - Proceed with Product Development**	**95.75 days**	**31/05/05**	**12/10/05**	
38	**Analysis Software Requirements**	**10 days**	**31/05/05**	**14/06/05**	
39	Conduct needs analysis	5 days	31/05/05	07/06/05	Technical Manager
40	Draft preliminary software specifications	3 days	07/06/05	10/06/05	Technical Manager
41	Develop preliminary budget and delivery timeline	2 days	10/06/05	14/06/05	Executive
42	Review software specifications and budget	1 day	10/06/05	13/06/05	Technical Manager,Executive
43	Incorporate feedback on software specifications	1 day	13/06/05	14/06/05	Executive,Technical Manager
44	**Hire Support Staff**	**36 days**	**07/06/05**	**27/07/05**	
45	Interview and test candidates	10 days	07/06/05	21/06/05	Executive
46	Hire staff (Technical Team)	10 days	21/06/05	05/07/05	Executive
47	Train staff	16 days	05/07/05	27/07/05	Executive
48	**Design**	**17 days**	**05/07/05**	**28/07/05**	
49	Review preliminary software specifications	2 days	05/07/05	07/07/05	Technical Manager
50	Asses industry trends and existing solutions	3 days	07/07/05	12/07/05	Technical Team
51	Develop functional specifications	5 days	12/07/05	19/07/05	Technical Team
52	Develop prototype based on functional specifications	4 days	19/07/05	25/07/05	Technical Team
53	Review functional specifications	2 days	25/07/05	27/07/05	Executive
54	Incorporate feedback into functional specifications	1 day	27/07/05	28/07/05	Executive
55	**Development**	**22.75 days**	**28/07/05**	**30/08/05**	
56	Review functional specifications	1 day	28/07/05	29/07/05	Developer
57	Identify design parameters	1 day	29/07/05	01/08/05	Developer
58	Select and review development methodologies	1 day	01/08/05	02/08/05	Technical Manager
59	Assign development staff tasks	1 day	02/08/05	03/08/05	Technical Manager
60	Develop code	15 days	03/08/05	24/08/05	Developer
61	Set up testing environment	2 days	03/08/05	05/08/05	Technical Team
62	Developer testing (primary debugging)	15 days	09/08/05	30/08/05	Developer
63	**Testing**	**8 days**	**30/08/05**	**09/09/05**	
64	Develop unit test plans using product specifications	4 days	30/08/05	05/09/05	Technical Team
65	Develop integration test plans using product specifications	4 days	05/09/05	09/09/05	Technical Team
66	**Unit Testing**	**15 days**	**05/09/05**	**26/09/05**	
67	Review modular code	5 days	05/09/05	12/09/05	Technical Team
68	Test component modules to product specifications	2 days	12/09/05	14/09/05	Technical Team
69	Identify anomalies to product specifications	3 days	14/09/05	19/09/05	Technical Team
70	Modify code	3 days	19/09/05	22/09/05	Technical Team
71	Re-test modified code	2 days	22/09/05	26/09/05	Technical Team
72	**Integration Testing**	**12 days**	**26/09/05**	**12/10/05**	
73	Test module integration	5 days	26/09/05	03/10/05	Technical Team
74	Identify anomalies to specifications	2 days	03/10/05	05/10/05	Technical Team
75	Modify code	3 days	05/10/05	10/10/05	Technical Team
76	Re-test modified code	2 days	10/10/05	12/10/05	Technical Team
77	**Documentation**	**31 days**	**28/07/05**	**09/09/05**	
78	Develop complete technical specifications for product	14 days	28/07/05	17/08/05	Technical Team
79	Develop Maintenance Training Manual	8 days	17/08/05	29/08/05	Technical Team
80	Develop user manuals specifications	1 day	29/08/05	30/08/05	Technical Team
81	Develop user manuals	4 days	30/08/05	05/09/05	Technical Team
82	Review all documentation	2 days	05/09/05	07/09/05	Technical Team
83	Incorporate documentation feedback	2 days	07/09/05	09/09/05	Technical Team





84	**Phase 3 - Pilot**	**102.75 days**	**09/09/05**	**01/02/06**		
85	Assign pilot stage resources	1 day	09/09/05	12/09/05	Executive,Technical Manager	
86	Secure customer commitment to participate in commercialization trials	9 days	12/09/05	23/09/05	Executive	
87	**Trial Product Manufacture**	**61.75 days**	**23/09/05**	**20/12/05**		
88	Resolve raw material and finish products logistics	7 days	12/10/05	21/10/05	Developer,Technical Manager	
89	Review trial plan and requirements	3 days	23/09/05	26/09/05	Developer,Technical Manager	
90	Start trial material production	3 days	21/10/05	26/10/05	Technical Manager,Developer	
91	Monitor customer trials	28 days	21/10/05	30/11/05	Technical Manager,Developer	
92	Review preliminary trial results	7 days	21/10/05	01/11/05	Developer,Technical Manager	
93	Complete customer trial monitoring	14 days	30/11/05	20/12/05	Technical Manager,Developer	
94	**Trial Analysis**	**31 days**	**20/12/05**	**01/02/06**		
95	Confirm sales and marketing strategies	4 days	20/12/05	26/12/05	Marketing	
96	Confirm product risk assessment	4 days	20/12/05	26/12/05	Technical Team	
97	Reevaluate manufacturing processes	7 days	20/12/05	29/12/05	Technical Team	
98	Develop commercialization plan	8 days	29/12/05	10/01/06	Marketing	
99	Review financials	7 days	10/01/06	19/01/06	Executive	
100	Review legal issues	14 days	26/12/05	13/01/06	Legal	
101	Assign commercialization leadership responsibility and resources	1 day	19/01/06	20/01/06	Executive	
102	Pilot stage review and commercialization decision	8 days	20/01/06	01/02/06	Executive	
103	**Phase 4 - Commercialization Stage**	**300 days**	**01/02/06**	**28/03/07**		
104	**Product Manufacturing and Monitoring**	**98 days**	**01/02/06**	**19/06/06**		
105	Confirm product specification	3 days	01/02/06	06/02/06	Technical Manager,Executive	
106	Confirm customer specification acceptance and trial participation	14 days	06/02/06	24/02/06	Executive,Technical Manager	
107	Revise manufacturing process requirements	5 days	24/02/06	03/03/06	Executive,Technical Manager	
108	Revise design and order new equipment	6 days	03/03/06	13/03/06	Executive,Technical Manager	
109	Install and test new equipment or equipment modifications	7 days	13/03/06	22/03/06	Executive,Technical Manager	
110	Confirm manufacturing capabilities	3 days	22/03/06	27/03/06	Executive,Technical Manager	
111	Develop and review production trial plan (resolve logistics issues)	7 days	27/03/06	05/04/06	Executive,Technical Manager	
112	Monitor customer acceptance testing	60 days	27/03/06	19/06/06	Executive,Technical Manager	
113	**Commercialization Analysis**	**26 days**	**19/06/06**	**25/07/06**		
114	Review production performance results	16 days	19/06/06	11/07/06	Executive	
115	Identify long term production requirements	6 days	11/07/06	19/07/06	Executive,Technical Manager	
116	Recalculate product economics	8 days	11/07/06	21/07/06	Executive	
117	Affirm decision to continue commercialization program	2 days	21/07/06	25/07/06	Executive	
118	**Post Commercialization Review**	**262 days**	**27/03/06**	**28/03/07**		
119	Determine if product is meeting customer expectations	90 days	27/03/06	31/07/06	Technical Manager,Executive	
120	Determine if sales have met projections	180 days	27/03/06	04/12/06	Executive	
121	Determine if product is sustaining against competitive response	45 days	04/12/06	05/02/07	Executive,Technical Manager	
122	Evaluate manufacturing process for stability and cost effectiveness	120 days	31/07/06	15/01/07	Executive	
123	Determine if current economics are consistent with projected	7 days	05/02/07	14/02/07	Executive	
124	Evaluate opportunities to refine product or product line	30 days	14/02/07	28/03/07	Technical Manager,Executive	