



CompStrat Consulting Inc.

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Team 3 :

Rohit Gupta

Nebo Iwenofu

Cynthia Mayer

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A. Executive Summary

Technology shapes today's future. Life without technology and gadgets today seem to be so incomplete and impossible. In an era where personal computing is at its peak, Apple Inc. is known for its leading technological advancements. They have a brand image and an amazing user interface creating a unique user experience. With a wide portfolio of successful products and always focusing at being top notch, it is difficult to picture Apple making an unsuccessful product which encountered so much criticism and then having to terminate the product line. This is what happened to Apple's Newton Messagepad.

In this report, we are going back in time to help the design team at Apple to make a successful product that satisfies the customer's needs and is relevant to that setting. Back in 1993, the launch of Newton Messagepad was much anticipated and there was so much press about its handwriting recognition software that all other features were almost ignored. We have studied the position of the company in 1993 in terms of resources and product readiness for this particular launch. A considerable amount of research on the company's competition and other external forces that are important at that point are analyzed.

Based on these analyses, we are recommending a target segment for Newton. We are then analyzing the needs of this segment to identify the job to be done. The company can then focus on developing the features around this core job to be done. Apple having a pool of talented engineers have the capacity to release a best in class product, but it is essential they divert this capacity into creating a product that does not overwhelm the customer with too many features. This is very critical at this moment because the company is facing issues with a few of its features and there is lot of pressure from the management and public for the product release.

By consolidating the most important features and the company's readiness for the product, we are proposing a first version of the product with a potential for future versions. We have put out a value proposition for this product as per our analyses and believe that the product will meet the customer needs. We have proposed a list of recommendations keeping in view the design, the launch, the improvements, sales and future work. We have also considered a possible chance of "palace intrigue" in the current management setup of Apple and have proposed actions to prevent any possibility of this affecting the product.

We believe that these set of recommendations will help the design and management team at Apple Inc to not just design a product that fulfills the customer requirements but also facilitates a successful launch. We believe that this technology will pave the platform for a new generation of personal computing devices.

B. Apple and Computerization in the 1990's

B.1. The company's vision

Apple Inc was founded in 1976 by Steve Jobs and Steve Wozniak. They aimed to get a computer in the hands of everyday people. They succeeded in doing so, and Apple became the first company to launch lines of personal computers successfully. With the success of Apple II and Mac, Apple established itself as a visionary in the field of personal computers. The years from 1986-90 were considered to be the golden age of Apple as it became the only choice of people looking for user-friendly computers. The return on capital employed during this period was above 100%.¹ But the golden age ended in 1990 with the launch of Windows 3.0² and the PC market became a red ocean due to the increasing number of PC manufacturers.

Now, after 16 years, in 1993 we are seeing a sharp rise in computer ownership and more corporations are computerizing their tasks. Apple believes personal computers are the future and they are going to change the way we communicate. Currently, with internet speed reaching 56kbps using a dial-up connection, a song can be downloaded within 30 minutes³. Apple is looking forward to revolutionizing PC industry again with a disruptive product "Newton MessagePad" and is looking to create a blue ocean for the company. The other products to be launched this year are Macintosh LC III / III+, Macintosh Color Classic, Centris 61, Centris 650, Quadra 800, PowerBook 165c, Workgroup Server 80, Workgroup Server 95, PowerCD, Apple- Design Powered Speakers, PowerBook and Macintosh LC 520⁴.

B.2 Newton MessagePad - Conception and current status

In 1987, Apple executives decided to develop a mobile computing device. The CEO, John Sculley, was excited about the idea and decided to go with it and coined the term PDA (Personal Digital Assistant) to describe the new device. Company executive Steve Sakomen named the project Newton, and the team began working on it. The early prototypes were large in size and did not meet any requirements. When the project was taken over by Larry Tesler, the research showed that the market wanted a converged cellphone and a PDA. With the state of technology, the inclusion of cellular phone functionality was quickly ruled out as microelectronics could not be miniaturized⁵.

The design team came up with three models, Senior with size 9"x12" and cost around \$5000, a midsize model with size 6"x9" and cost less than \$2000 and finally the Junior with size 4.5"x7" costing around \$500. The team was able to convince the CEO that a larger sized device wouldn't be successful where as a notepad sized device could break through. They began working on the Junior with fervor to produce an acceptable prototype. In May 1992, John Sculley demonstrated Newton's prototype to the public. Newton was then attached to Mac

¹ "Apple Computer's Financial Performance - London Business School." <http://faculty.london.edu/chigson/casestudies/pdfs/apple.pdf>. Accessed 8 Feb. 2018.

² "Mac vs. Windows: The History of OS Competition | Singapore Blog" 7 Jul. 2015, <https://www.vodien.com/blog/technology/mac-vs-windows-the-history-of-os-competition.php>. Accessed 8 Feb. 2018.

³ "1994 in technology: What the Internet, computers and ... - Syracuse.com." 2 Nov. 2014, http://www.syracuse.com/news/index.ssf/2014/11/technology_history_internet_computers_phones_1994.html. Accessed 8 Feb. 2018.

⁴ "The Apple Timeline." <http://www.theappletimeline.com/>. Accessed 8 Feb. 2018.

⁵ "An Abridged Apple Newton History" <http://myapplenewton.blogspot.com/p/abridged-apple-newton-history.html>

as it was too unreliable to run on its own. However, despite few problems getting it to work, the demo was wildly successful and sent the market into a frenzy. The feature that captured most eyes was the handwriting recognition system, but it was just but one of the several features that were included. The CES show in January 1993 had been successful too⁶.

All the positive press generated from the demo events and press presentations are putting tremendous pressure on the team to get everything incorporated into launch. There are still several problems with the handwriting recognition system that needs fixing. The user interface design hasn't been given much thought, as the priorities up to this point have been incorporating all the features.

B.3. Computer usage in the 1990's

IT products such as computers are sold in three main channels currently: computer superstores, computer company salespersons, and local computers vendors or stores⁷.

In the 1990's, a research showed that people who bought PC's used them mainly for word processing and simple spreadsheets purposes⁸.

It is evident that the rivalry in PC market is increasing and that Microsoft is winning with its Windows product but currently Apple has a strong base of loyal Mac users who prefer Macs over Windows because of the user-friendly, intuitive nature of Macs. Similarly, there are many corporations who are using Macs to increase productivity at their workplace. We could leverage this loyal customer base and our broad reach in corporations to get early adopters for the Newton MessagePad.

B.4. Possibility of Palace Intrigue

In 1985, the Apple Board had sided CEO John Sculley and had to put the then Chairman Steve Job's vision of replacing IBM PCs with Macintosh in vein. Steve Jobs was admired for his design skills and forward thinking. Both Sculley and Jobs were known to have different visions for Apple. Steve Jobs resigned and the company proceeded under the leadership of Schulley.

There were a couple of management reshuffles following this and Apple was prioritizing its products under the leadership of Sculley. Sculley soon studied the availability of resources within the company at the moment for developing a handwriting recognition software which could be integrated into a personal hand held device with the Newton line of products⁹. He noticed the potential of such a product not just improving Apple's reputation but his own reputation as well. Also, this was not a pet project to Steve Jobs like the Mac and Sculley envisioned that he could claim sole ownership for this product and establish his credibility as a leader with a very futuristic vision for the technology company.

⁶ "The Story Behind Apple Newton" - <https://gizmodo.com/5452193/the-story-behind-apples-newton>

⁷ http://hcd.ucdavis.edu/faculty/webpages/kenney/articles_files/Internet%20and%20the%20Personal%20Computer%20Value%20Chain1.pdf

⁸ <http://www.nytimes.com/1990/01/16/science/personal-computers-smart-typewriter-may-be-an-intelligent-choice.html>

⁹ "Stylus counsel: The rise and fall of the Apple Newton ... - The Register." 17 Sep. 2013, http://www.theregister.co.uk/Print/2013/09/17/20_years_of_the_apple_newton/. Accessed 8 Feb. 2018.

C. How should Apple tailor its new offer?

C.1 Industry landscape

We are using the Porter/Hopper forces framework to do a situational analysis.

Industry Rivalry: This has a high threat to limit Apple's profits from the Newton. Apple are the trailblazers in this space but they have a plethora of followers like Palm and Nokia. Industry rivals have the power to limit Apple's profits by releasing similar products to the Newton. Since the product category is truly novel and customers are not yet locked into our product, the threat of the competition eating into Apple's first mover advantage is very high.

The threat of New Entrant: This force has a low to the medium threat to Apple's profits from the Newton product line. The capital investment needed and heavy industry competition acts as a strong barrier to entry to a new entrant.

The threat of Substitutes: This force has a high threat to Apple's profits from the Newton product line. The substitute to the Newton at this time is the use of notebooks, agendas and address books and other personal computers. The customer base is more familiar with Newton's substitutes and needs a very compelling product to change behaviors.

Supplier Power: Apple is heavily reliant on the ARM to produce processors for the Newton. However, Apple owns 43% of the company at the time and also had a plethora of other suppliers that can be used if ARM is unable to meet Apple's demand for processors. Because of the competition from bigger suppliers, this force has a low threat to Apple's profits.

Buyer power: This has a high threat to limit Apple's profits from the Newton. Personal computers, and by extension PDA's, are not 'sticky' to customers (i.e., customers are used to live without them) and the majority of the market views them as a 'nice to have'. Buyers can just not buy a computing product they don't need and still function at a relatively high level.

Technology & Pace of Change: This has a high threat to profits from the Newton. Apple bets big on Newton's handwriting recognition technology being a big winner on the market. If the market doesn't take to the technology or a substantially better technology is released right after the Newton, Apple's profits would be adversely affected.

Globalization: This has a low threat of limiting profits. The only threat to the Newton that could arise from globalization, is the theft of Apple's intellectual property on the Newton and then the cheap production of a similar product overseas for sale in the US markets. This scenario is, however, highly unlikely.

Government: Government has a low threat to the success of the Newton product line or Apple as a whole. Apple can face some antitrust charges if it becomes a monopoly but this seems highly unlikely given our current competitive landscape.

Social and Cultural Shifts: This has a low to medium power to limit Apple's profits on the Newton Message pad. The early 90's is an inflection point in the history of personal computing in the domestic market. Enough customers have begun to embrace computers but they (personal computers) are yet to breakthrough to the majority of the domestic market. At this point, personal computers can be viewed as just a fad and demand for them can plummet or they can be viewed as essential to everyday life and increasing productivity. Should the former occur, Apple's investment in the Newton products will be wasted?

Complements: This has a medium to the high threat to Apple's profits on the Newton. A lot of personal computing at this time is used for productivity (i.e. for work). This means, that for the Newton to realize its value in the form of profits, it needs to support a considerable amount of productivity applications. Low support for these applications or better support from competing devices will adversely limit the profits of the Newton.

The summary of Porter's/Hopper's forces is the following:
(red for high risk, orange for medium risk and green for low risk.)

Globalization	Supplier Power	Government
Threats of Substitutes	Industry Rivalry	Buyer Power
Technology & Pace of Change	Threat of New Entrants	Social, Cultural and Economic Shifts

Based on our analysis using the Porter's/Hopper's framework, we anticipate that the threats to the success of the Newton are:

- the rivalry in the technology space
- customers finding substitutes to the Newton more appealing because of better functionality or lower prices
- the absence of complementary products and/or services to the Newton
- the invention of superior technology.

Along with the following analysis, the Recommendation Part D will answer how to answer those threats and minimize their impacts on Apple's success for the new product.

C.2 Customer Segmentation & Targeting

The customers are segmented based on the ownership of computers.

We identified that there are two types of users who use computers:

- ones who use computers for their office work
- and others who own computers for personal use.

The reasoning behind the customers who use or own computers is that appeal of our product will be more to these users since we plan to give them computing power on the go. There are 91 million¹⁰ households currently in the US and there are 23%¹¹ households having computers (i.e 20 million households with computers). The market size is quite big and could prove to be profitable. Another reason to target this segment is that this segment is aware of the our product and it will be comparatively easy to move them from “consideration” to “conversion” stage.

Despite 20 million households having a computer, the computer market is dominated by corporations. As per one estimate, 75%¹² of computer owners by volume were corporations. **Therefore, the primary target group for Newton MessagePad is corporate customers.**

C.3 The Job To Be Done

The first Newton product is targeted at business users. Since they are the major users of personal computers, we are creating a product that solves a subset of their pain points¹³.

The personal computer is gaining popularity among business users and they are able to increase their productivity exponentially. Business users are able to increase the quality of their output over time by leveraging their computer applications. Businesses are eliminating tedious and manual tasks by using personal computers and focusing employees on more important tasks. However, today, this productivity ends when the person leaves his/her work desk with the PC up to some extent. People that want to stay ‘plugged in’ by catching up on some reading, write a quick note, or access their professional phone book to contact a client are left stranded - unproductive. Today’s solutions center around more manual work like driving to the office or writing on a piece of paper that is easy to lose and the difficulty to communicate or pass information immediately. We are designing the Newton as a product that will solve these customer productivity and management pains. We are designing this product to solve the customer pains that will make them most productive and facilitate remote work management.

C.4 Feature Prioritization

Within the scope of Apple’s resources and capabilities, below is the list of features we identified to potentially incorporate in our first version of Newton. We recognized the value to the customer and ease of implementation/development as the key metrics to prioritize the features. Since the value to the customer provided is critical, it has twice the weight than that of ease of implementation. The weighted total is then

¹⁰ "Projections of the Number of Households and ... - Census Bureau." <https://www.census.gov/prod/1/pop/p25-1129.pdf>. Accessed 8 Feb. 2018.

¹¹ "Computer and Internet Use in the United States - Census Bureau." <https://www.census.gov/prod/2013pubs/p20-569.pdf>. Accessed 8 Feb. 2018.

¹² "The Truth About Windows Versus the Mac – Stratechery by Ben" 1 May. 2013, <https://stratechery.com/2013/apple-open-and-learning-from-history/>. Accessed 8 Feb. 2018.

¹³ "History of Computers in the workplace" - <https://bizfluent.com/about-6362639-history-computers-workplace.html>

considered and broken into sections of **Must** have features (weighted total >10), **Should** have features (weighted total=10), **Could** have features (weighted total >7 and <10) and **Would** have features (weighted total <7).

Potential Features	Value to the customer (1 to 5)	Ease of Implementation /development (1 to 5)	Weighted total (2*(value to the customer) + (ease of implementation)) (3 to 15)
Portability	5	2	12
Stylus-based (comfort of using a pen)	4	3	11
Small size (be able to fit in a pocket)	5	1	11
High battery life	4	2	10
Make notes and sketches	5	4	14
Handwriting recognition	3	2	8
Synchronization of files, calendar, contacts with PC	5	4	14
Fax	2	3	7
Email access	3	3	9
Electronic business card	2	3	7
Reminders/calendar events	5	5	15
Light weight (<1 pound)	4	1	9
Store contacts	3	4	10
File transfer to PC	3	4	10
Printing files by connecting to printer	2	4	8

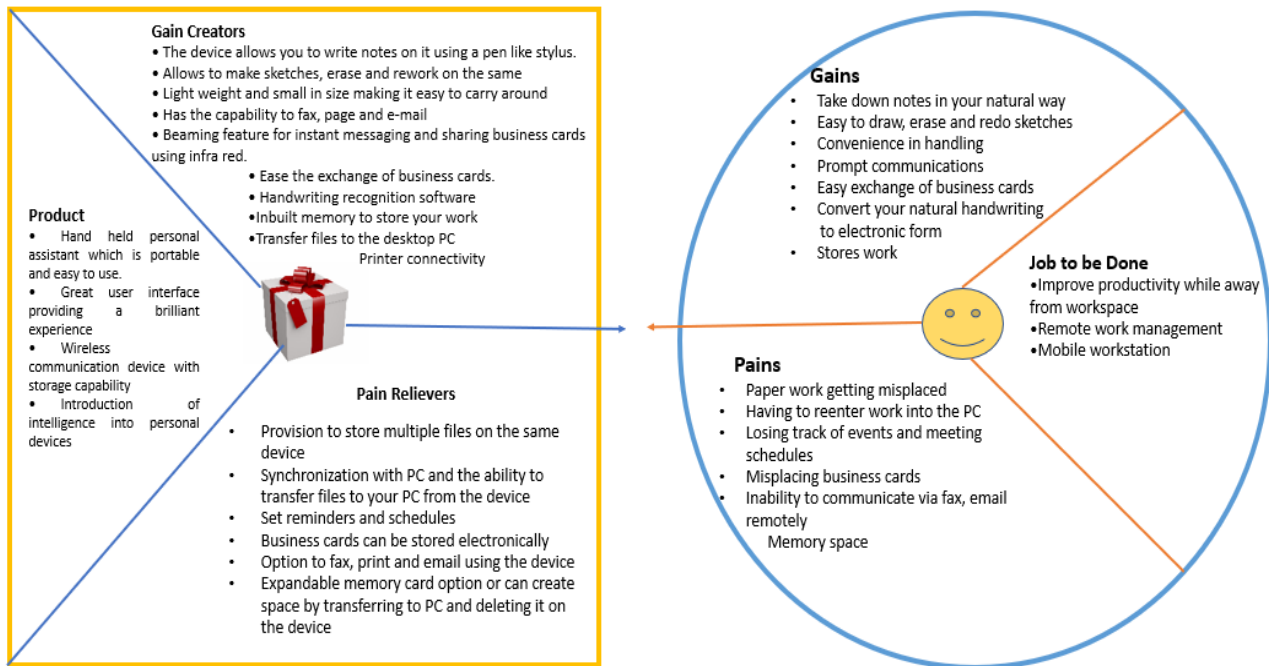
Tools such as calculator, currency converter, and time-zone maps	2	4	8
Infrared transfer between message pads	2	2	6
Editing documents	2	4	8

Based on the analysis above, the following table presents the prioritization of the features to adopt in our new product:

Must (essential) (11 and above)	Should (needed but not essential) (=10)	Could (nice to have) (>7 and <10)	Would (not required but might add in future) (7 and below)
Reminders/calendar events	High battery life	Email access	Fax
Portability	Stylus-based (Comfort of using a pen)	Light weight	Infrared transfer between message pads
Small size	File transfer to PC	Printing files by connecting to printer	Electronic business cards
Make notes and sketches	Store contacts	Tools such as calculator, currency and time zone maps; Editing documents	
Synchronization of files, calendar, contacts with PC		Handwriting recognition	

C.5 Value Proposition

Having analyzed the customer needs and having the capacity to facilitate these customers by incorporating technology in their day to day lives, Apple is ready to release a personal device. The following is the value proposition for the product :



- The product focuses on integrating those features which facilitate the customer to get the job done. In addition to getting the job done, the product helps the customer to transition to the next step in technology¹⁴.
- We observe a number of pain points which a customer encounters regarding work and its correspondence. This product provides a solution to relieve the customers from those pains and make day to day life easier and efficient.
- The product is also accompanied by a portfolio of gains that increase the comfort of the users and provides them with additional features.

¹⁴ "Apple Newton Getting Started Video" - <https://www.youtube.com/watch?v=64QuJdJmCbA>

D. Design & Operational Recommendations

D.1 Initial product with the most important features

Apple is going to launch a product which is new in the market and yet to be acquainted with the customer, which we chose to be the corporation employees and executives. We would ensure that the first version of the product contains those features that are easy to use and adds value:

- Make notes and create easy sketches
- Calendar & reminders feature
- Synchronization of files, calendar, and contacts with PC
- To-do list

Rather than focus on releasing the product with all the nice to have features, we recommend Apple prioritize features that solve core customer pain points and can be developed and maintained given our current technology expertise. Features that don't solve core customer issues or we can't yet develop can be released at a later date as incremental improvements. This way, Apple has the chance to perfect the technology behind the features and test that it's useful to customers.

This way the customer learns to incorporate the product and the new technology in their day today life to satisfy their needs. Apple will have to ensure that the implementation and development of these features go seamlessly.

Also having a flawless product initially, the customer is better satisfied and gains their trust towards the 'Newton MessagePad' new line of products.

D.2 Ensure Market Readiness

Apple as a forerunner in technology advancements should ensure that the customers are ready to adopt the product. They should have the facilities to incorporate the product into their day to day lives during work. Launching a product with all the hi-tech features but that cannot be utilized by the customer due to the lack of supporting resources at his/her end will put the product in vain.

For example, the feature of sending an email from the device is to be supported by the availability of internet connectivity away from the desk. We recommend that Apple make collaborations with internet service providers so that this service is available to the customer when the product is available in the market.

D.3 Getting the Handwriting Recognition Software Right

The handwriting recognition feature is something which was announced and promised to the people by the company. People are eagerly waiting to experience this brilliant technology. We recommend that Apple fasten the development of a reliable handwriting recognition software and only launch it when it can be substantially reliable. This increases the credibility of the Newton product line.

D.4 Focus on User Interface

While launching a product that is essentially new to the market with a technology that is yet to be adopted by the customer, it is important for Apple to make the user interface that is friendly and easy to incorporate as a part of work. Most importantly when our primary customer is going to be business and working-class people for whom every minute is valuable, the user interface becomes very essential. They will not be ready to tolerate glitches and delays at work due to the device.

D.5 Gathering user feedback through creating a core customer base in corporations

We suggest launching the product in stages to make sure the product is well functioning before it reaches masses.

- In an alpha stage, Newton can be made available to Apple's employees (different than the ones who made it). A first feedback can be gathered from them.
- In a beta stage, since the Newton is creating a completely new product category, Apple can partner with some influential target customers/market leaders to educate them on the core functionality of the Newton and which of their pain points it solves. MessagePad could be offered as a trial version to Apple's partners' employees after receiving formal presentations on how to use it. More feedback could be gathered to enhance MessagePad's satisfaction to customers, at the same a core base of customers is being created.

This stagewise implementation will ensure a final product that provides the satisfying user experience. This way, the effectiveness of the Newton can spread through word of mouth and Apple can control the narrative and early perceptions of its product in the market.

In a final stage, the Newton can be officially launched throughout all our target customers - all corporations using personal computers on a day-to-day basis.

D.6 Strategize Public Relations & Sales Strategy

We recommend that Apple migrate its marketing focus away from the handwriting recognition feature. Apple is yet to perfect this technology and it is not clear that this feature solves a pressing customer pain. Focusing marketing efforts on this feature may provide early buzz in the short term but will not translate in the long term as customers don't necessarily need the feature and it doesn't work in its current iteration. This may create confusion among our target customers and damage Apple's reputation in the market.

At each launch stage (alpha, beta), market research should be conducted over Newton's usage and customer satisfaction. The results of this market research should then be made available to journalists in the corporate space. Testimonies and data about how Newton has been a success story in some companies will help other companies being interested in our products, and be publicized positively. Apple should focus on intensive salesforce as well as participate in IT/corporate - related events where MessagePad can be presented, flawless, with testimonies of previous users. With the support of the established core customer base, Apple will be able to create a trend to attract all corporations executives and convince them to adopt MessagePad.

D.7 Pricing Strategy

Apple will have to price Newton as per the features and value each version provides. The prices could then be increased as the functionality increases. At every point, it is important to ensure that the customer is satisfied with the offering of the product with respect to the price paid. At the same, Apple has to be careful not to give a price too close to the one for a real computer, as Newton cannot offer the same wide range of features that computers have. It is limited by its hardware and its usability due to the screen size. So, for now, we recommend that the product is priced around \$400 for the initial offering. This price is above the price of a pager and at the same time justifies the additional price for providing productivity away from the work desk. With this satisfaction, the customer is then willing to pay more as the features increase.

D.8 Conveying the Value Proposition through the product's brand

As demonstrated before, the value proposition of Newton's product is not the messaging aspect - which is absent from our 1st version of the product. It is the improvement of productivity at work, being able to do business anywhere, even if not on your desktop. "MessagePad", even if used throughout the document for simplicity, is not a relevant name for selling. Instead, we suggest renaming it Desktop for example, as a Mobile Desktop. Both productivity and mobile benefits are expressed through the name, that can be also supported by the adequate brand motto: "Business Anywhere", rather than "Communications Assistant".

In this sense, marketing plan could produce a better advertising video than the one released last year in 1992. Instead of focusing on presenting the features without a clear flow, focus on presenting the use cases when an employee would need to access its computer's files while being away from the desk, and how Newton is helping them doing so. Insist on the benefit given by Newton against its substitutes like paper.

By example, featuring two consultants at the airport: one who has difficulty carrying thousands of folders for the clients, and the other who has a Newton device and is calmful, revising his client's files on the device very easily while waiting for his plane.

D.9 Preventing failure from competition

Based on our analysis of the threats from the industry landscape, we suggest the following to reduce the impact risk of those:

Threat	Suggested solution to minimize impact
Rivalry in the technology space Invention of superior technology	Keep innovating and patent everything Apple does, so that it would discourage competitors from developing similar technology
Customers finding more appealing substitutes to the Newton because of better functionality or lower prices	Have a clear marketing message as depicted in D.8. Focus on user interface in the devices and focus on the whole user experience streamlining
Absence of complementary products and/or services to the Newton	For future versions of MessagePad, dedicate from now an engineering team to create basic office software that can read & edit word files, spreadsheets... and keep improving those.

D.10 Design for Market Innovation

We suggest a recommendation of making our patents related to PDAs public and ask for collaboration as the PDA technology is still in its initial phase. The advantages of doing this include: a talented pool of engineers specialized in PDA technology space, development of supply chain and other infrastructure required to produce superior PDAs.

Initially, we recommend Apple to focus on designing Newton to fit the requirements for a professional setting. But, the company still has to focus on adding features to the future versions that will innovate a new segment of users. Introduce fun aspects into the product that would attract another set of customers, who would primarily use it for designing and for personal reasons. People often make a style statement in associating with a brand and the design should be able to innovate a market that adopts technology in personal lives and is proud to do so.

In the future, Apple can expand their PDA product line with a Newton product targeted at the other identified market segment - customers that are yet to adopt personal computers. Apple can create a product that introduces people that are yet to use our own computers in the world of computing. This product should have limited functionality and be designed to be intuitive to the mass market. The product design should also be aesthetically pleasing and have game applications and/or applications that aid in social interactions to be inviting to customers in this market segment.

D.11 Preventing Palace Intrigue

To avoid a repeat of all the politics behind the development and release of the Newton, Apple should create a set of rules and metrics to be used to objectively judge the development and release of a product. These rules and metrics will be effective especially in cases where influential managers are pushing for the development of a product for their own selfish reasons.