

Google Glass: A promising innovation ruined by lack of vision

MSc All Awards
Coursework for Project Management Module

Author: Pratik Shrestha

Degree: MSc Information and Technology

School of Computing, Creative Technologies and Engineering

Leeds Beckett University

Candidate's Declaration

I, Pratik Shrestha, confirm that this report and the work presented in it are my own achievement.

Where I have consulted the published work of others, this is always clearly attributed;

Where I have quoted from the work of others the source is always given. With the exception of such quotations this research report is entirely my own work;

I have acknowledged all main sources of help;

I have read and understand the penalties associated with Academic Misconduct.

Signed:

A handwritten signature in black ink, appearing to be 'Pratik Shrestha', written over a horizontal line.

Table of Contents

LIST OF ABBREVIATIONS.....	4
1 SECTION ONE: CASE STUDY.....	5
1.1 Introduction and Background.....	5
1.2 Contemporary Issues and Methodologies.....	6
1.3 Analysis of Problem(s).....	9
1.4 Findings and Recommendations.....	12
2 SECTION TWO: PROJECT MANAGEMENT STRATEGIES.....	13
2.1 Introduction.....	13
2.2 Rationale.....	13
2.3 Justified Business Objective.....	14
2.4 Methodologies and Management Approaches.....	15
2.5 Detailed Strategy/Solution.....	16
2.6 Conclusion.....	22
3 REFERENCES.....	23

List of Abbreviations

- **HUD:** Heads Up Display
- **HMD:** Head Mounted Display
- **PR:** Public Relations
- **ASQ:** American Society of Quality
- **DMAIC:** Define, Measure, Analyze, Improve and Control
- **DMADV:** Define, Measure, Analyze, Design and Verify
- **QFC:** Quality Function Deployment
- **HOQ:** House of Quality
- **WBS:** Work Breakdown Structure

1 SECTION ONE: Case Study

The infamous Google Glass was first introduced by google in 2013 to a selected group of consumers and later on to a more wider group of buyers in 2014. This product was developed by Google in its bid to replace smartphones with glasses and was hailed as quite a visionary product at the time. At present however, judging from more people carrying smartphones and barely any wearing google glasses, the project can be deemed a failure. This research project demonstrates how even a tech giant like Google can fall short of delivering a product as per expectations when proper project management strategies are failed to be applied. Finally, this research also proposes guidelines for appropriate measures that could have been implemented for project success.

1.1 Introduction and Background

Since the start of the 21st century, the emerging trend of wearables and smart-wears clearly was and still is attracting tech companies to invest in this sector and google was doing particularly that. The technical and functional features were indeed intact in google glasses. Seamless connection to internet enabling multiple online tasks to be done without even lifting a finger was all possible and the wearer was almost always in the convenience of having a screen right in front of his/her eyes. This was a HMD device which could give notification in a HUD, make phone calls, receive messages and emails, record audio/video, it was basically a computer compacted into a wearable glass all the while being navigable and operated with your eyes and voice alone and a touch panel for some added functionality (Silva M., 2014). Google also did not leave any stones unturned regarding PR and marketings, it went as far as hyping it up as a fashion accessory by displaying its eyewear on models and media figures. But ultimately, it failed and that begs the question of, well what went wrong ?

The more technically adapt consumers like developers and programmers were specially more invested in this product as it was after all a tech gadget than a fashion accessory and failing to realize that fact was one of the crucial reasons why this product failed. Google wanted its 'Glass' to be an everyday use

gadget by average consumers. With an introductory price of USD \$1500 it can hardly be considered to be priced right (Klein A., 2016). There could be an argument that the price point was same as that of a high end laptop and glass with its advanced new features and innovative approach could be considered at the same league. But the underlying problem was in Google's over estimation of its influence and brand identity. It is often said that upgrading customer behaviour is much harder than upgrading the technology (Chowdhury, S.K., 2018) and that is precisely what happened with Google Glass. In addition, the aggressive marketing and PR campaign of the not so well polished product only garnered negative feedbacks and reviews further hindering the products image. Collectively, lack of proper user case studies, failing to define a proper scope for their product and quality management were some of the biggest reasons behind the failure of Google Glass.

1.2 Contemporary Issues and Methodologies

Of the several multitude of reasons for failure of google glass the following are some of the most notable ones along with their justifications:

1. **Unaesthetic Design:** The design of google glass was such that it did not blend as a usual item but rather stand out because of its odd look. For example, Google is said to have first designed it in complete black color to give it a more strong presence, but upon rethinking that black might look too contrasting on white complexion they opted for a more subtle silver grey and colorful options, which only proves the lack of clear vision and target audience. Even reducing the weight of the glass was significantly from the original 6 pounds and making it lighter than usual pair of glasses was not enough to make it look less cybernetic. Eventually, people rather saw it as an odd item rather than a pair of luxury glasses that came with lots of technical benefits. The individuals in tech community seemed slightly accepting of the design thus showcasing a sheer lack of proper customer identification on Google's end and a bad case of quality management.
2. **Health hazards:** The odd positioning of the rectangular block lens i.e. right in front of the user's eyes without any protective medium was seen as a security issue in case of unwanted bumps or accidents. It is quite

difficult to claim that google did not do enough research on product design but clearly there were customers who were concerned of their safety after all eyes are really sensitive and prone to physical damage. There were also some misconceptions spreading regarding that the continuous close view could cause eye strains and other health problems and despite these rumours later on cleared as invalid by health experts the negative publicity had already done its damage. So despite the millions invested in PR and marketing, clearly the marketing and quality management was not at its level best.

3. **Privacy concerns:** At a day an age where users were already doubting over the cameras/microphones in their smartphones and laptops invading their privacy, the concept of using a device capable of doing the same with much ease clearly gave rise to a serious privacy concerns among users and potential buyers alike. The fact that glass could easily record videos using gestures, voice command or touching the side panel, any sort of network breach would mean people would be able to very directly monitor your actions. Even regular users could be recording videos or audio without anyone knowing about it and without the consent of people around. This would mean glass would have to be restricted in many public places because of privacy concerns alone hindering its original selling point of using it almost everywhere as a daily wear item. Hence proper stakeholder management also seemed lacking.
4. **Misaligned Marketing:** On contrary to some belief that google glass was marketed perfectly, It can also be argued that google went a little too far ahead with its PR campaign in trying to establish google glass as the next big thing. So far that it instead seeded doubts among the users whether or not it really was up to the level of the hype and it clearly underperformed. It might not have been as much of a failure if it was not so overhyped. The consumer base should have been narrowed down to technical users - geeks to be more blunt rather than trying to attract the overall consumer base. But not doing so and showcasing google glass as a fashion accessory instead pushed both types of crowd away as it was not cool enough for the regulars and the product was not pitched particularly for the tech savvy audience alone. It also was seen as an

isolating device rather than a device to enhance social interaction. In the age where people were having lesser and lesser social interactions being glued to their smartphones and virtual societies rather than interacting with people in their immediate vicinity google glass simply was presented as something that would further intensify this isolation among people.

5. **Lack of vision and scope definition:** Glass came with plenty of use cases, too many to be precise. When you market a \$1500 product but they are sold as something used for checking emails and browsing Facebook 24/7, that does not make a good sales case at all. The uses of glasses were shown to be in many sectors and that was true and are even being explored in today's date by many different companies and inventors. Their use in medical practice, accessibility features for disabled, real time language translation, assistance and augmented reality are all great and viable, but for a product launch they lacked an absolute or pin pointed use case. The UK department of transport had reportedly banned use of google glass while driving, sighting that it could be distracting, similar to use of a mobile phone and could cause accidents due to driver's divided attention. This completely nullified the potential use of google glass as a driving assistant despite having potential features as rendering maps and virtual driving signals in front of users eyes. The authorities could not rely people to be using only driving related apps while using google glass as it clearly was able to give notifications, make calls and perform many other tasks simultaneously. Further illustrating that not having a specific use case for google glass actually hurt it despite its endless potential. A proper brand management would have helped figured out a specific use case for the product and moved ahead with that idea rather than letting the consumers decide what the product is going to be used for. This all points towards a poor scope management.

6. **Losing velocity:** Delayed release dates and untracked versions of the product also caused the glass to lose even the last of its loyal followers. In 2015, two years after its first launch to a closed group of people, Google decision to hire Apple Executive Tony Faddel for redesigning the glass also cost significant time between successive launches as he was a

perfectionist and denied releasing the product before finding it to be flawless. The second iteration therefore was only released in 2017 and google was open for collaboration with optics company in 2019 stretching its primary release date of 2013 way past its expected deadline. Clearly there was lots of room for improvement in the sector of time management as well since the product had already lost a lot of its early hype.

All of these contemporary issues is summarised in the following Ishikawa diagram. Ishikawa or more popularly known as Fish Bone diagram is a great visual representation format for seeing the cause and effects resulting in a project failure.

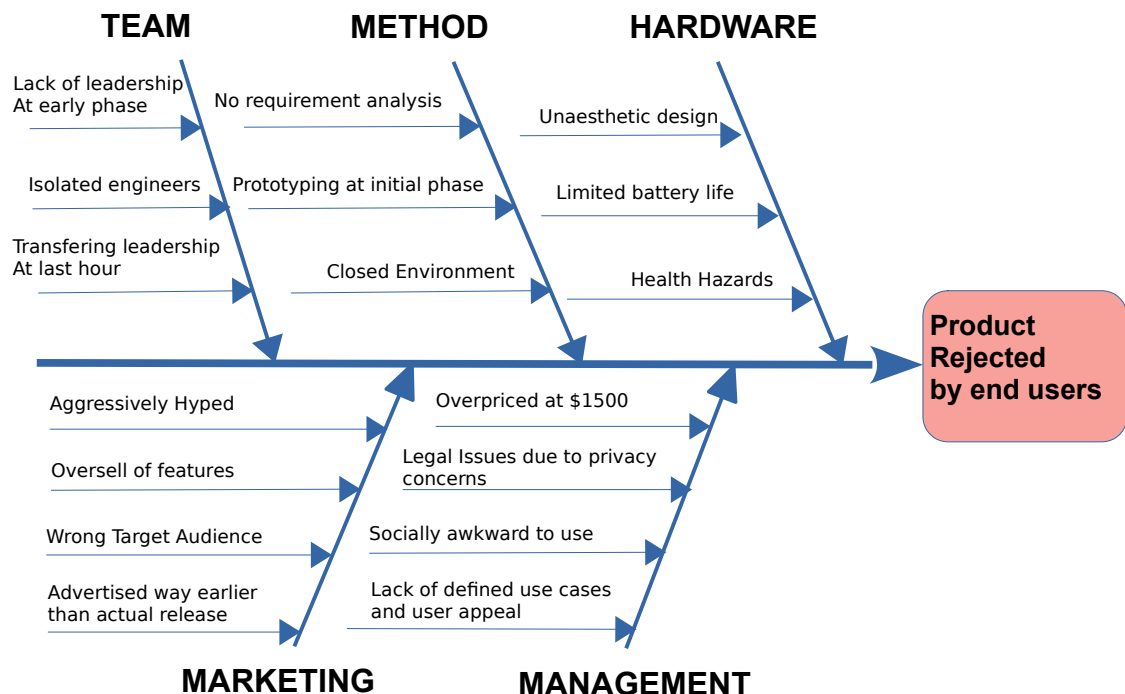


Illustration 1: Ishikawa diagram / Fish Bone Diagram

1.3 Analysis of Problem(s)

A simple qualitative analysis on the overall timeline of the project till it was effectively discontinued by Google itself was studied during this research at first so as to figure out the generic problem.

Google Glass – the brief journey

Despite the illustrious unveiling and a highly anticipated launch Google glass could not carry on in its early momentum and was a relatively short lived project that lasted a mere three years span. The infographics and bullet points below shows some crucial points in the life time of the project and briefly highlights what went wrong.

- **April 2012** – google glass unveiled via concept video and photos of the product
- **Mid 2012** – prototype demo at Google I/O
- **Late 2012** – showcased at New Year Fashion Week at Furstenberg
- **2013** – Larry Page gives his feedback on social media buzz at Google I/O 2013
- **2013** – People become aware regarding privacy concerns and glass gets a critical review
- **End of 2014** – The tide turns, people reject the glass, businesses, public domains and governments ban use of google glass.
- **16 Jan 2015** – project handover to Tony Fadell and glass team exits the Google X division. Google Glass sales ended.

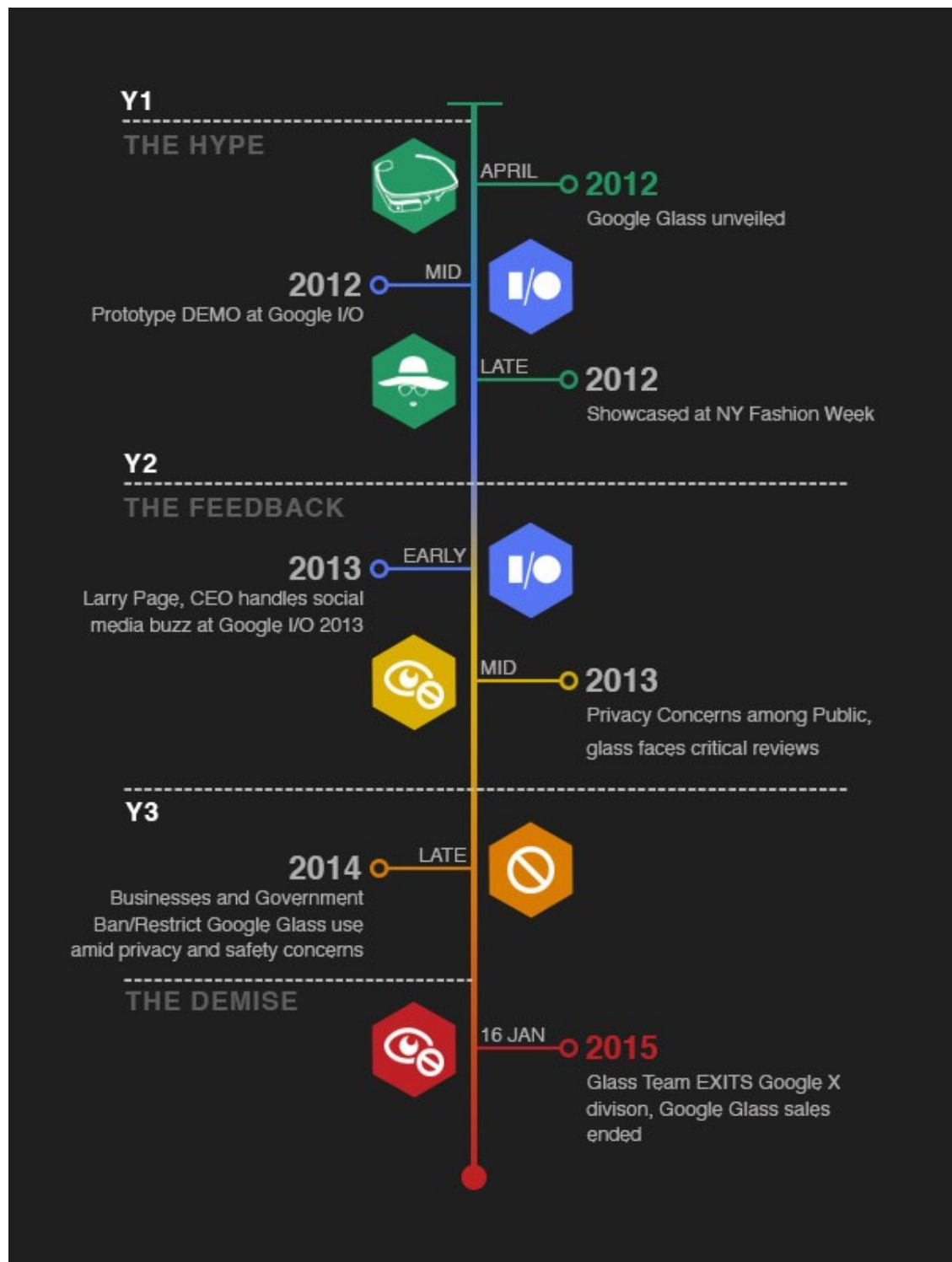


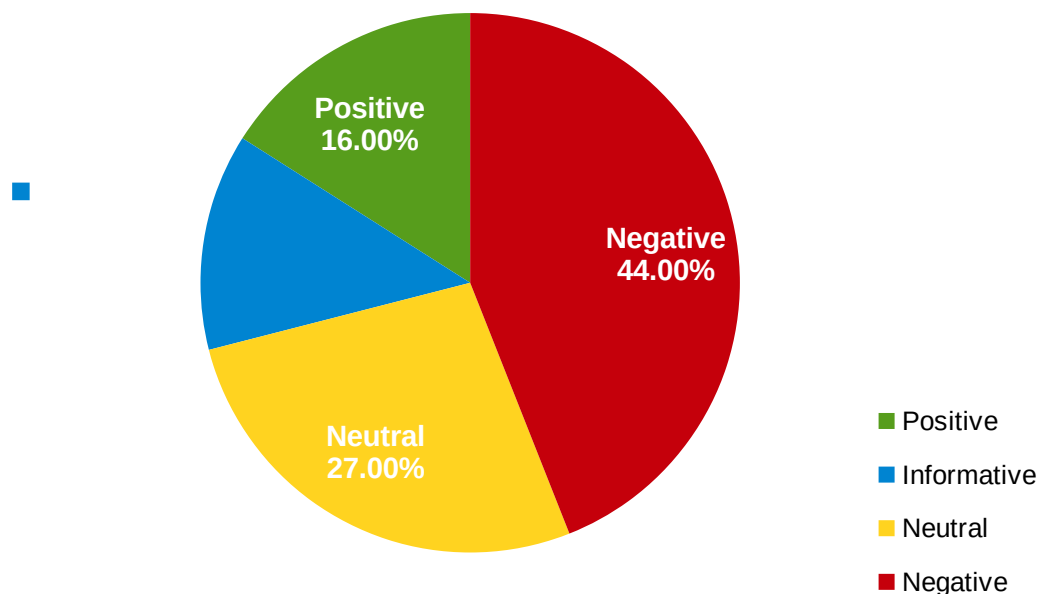
Illustration 2: Google Glass - Project Life Cycle - Time based

Despite making slight comebacks in the past few years, as various other companies including Apple have now started exploring more on wearable technologies, Google glass at the time of its debut can hardly be considered a success. This research does not cover the case of re-emergence of Google

Glass or glass like technologies in detail and leaves that part for future scope.

Furthermore a quantitative analysis indicates yet another core problem. It can be seen right at the launch phase where the popularity and overall image of Google glass in the eye of the public was seen as pessimistic. An online data research carried out based on keywords in relation to Google glass used in the social media platform twitter, between 6 to 21 May of 2013, shows overwhelming reactions as negative (Leo K, 2018). This was majorly due to the privacy concerns as discussed earlier.

Google Glass Opinion in Twitter between 6-21 May 2013 (Leo K., 2018)



1.4 Findings and Recommendations

For a multibillion dollar company like Google, clearly cost was not an issue from the get go. However, from several viewpoints it can be seen that there were clearly more than one reason for the failure of the ambitious project Google Glass. The failure of Google to carve out the scope of the project and in becoming more specific regarding what exactly was Google Glass supposed to be used for along with the repeated delays in deciding a proper launch and release date both hindered the project's success massively. A proper scope and time management might have resulted in a drastically different outcome for

this project and perhaps enabled it to live up to its initial hype. With that in mind the remaining part of this research focuses on the improvement measures that could have been implemented to ensure the success of Google Glass.

2 SECTION TWO: Project Management Strategies

2.1 Introduction

The first prototypes of Google Glass introduced in 2011 were bulky and heavy and were remarkably improved as the years followed by. In 2013 the device was released to the market to a limited group of people selected randomly as beta testers. After year the product was made available to the general consumers but due to the steep price tag, privacy issues and resulting legal issues caused its eminent downfall (Martinez-Millana, 2016). Other than the obvious technical and ergonomic issues in the product, facts like never really receiving a proper launch for the consumer market and google effectively pulling away its hand from the project in 2015, Google Glass could effectively be labelled as a failure. However, to address those issues section two of this report will be suggesting various project management strategies and steps that could have minimized the chances of project failure. Of the available methodologies, the Lean Six Sigma Approach, pioneered by Taichi Ohno, is the advisable one for this project for guiding it towards success. Justification to choosing this approach and comparative analysis with other popular options will be done in the following sections.

2.2 Rationale

Agile and Prototyping model are also suggestible for this project and are more popular option but there are some reservations regarding these models. J. Leroy Ward in his report "Top Ten Project Management Trends for 2011" suggests that one should be careful while using Agile approach as it might be useful for some but not for all the projects out there. Agile specially can be seen effective for the software field and since Google Glass involves fundamentally a hardware rather than software alone, using Agile approach might not address all the problems that resulted in its failure. Prototyping, makes slightly more sense since this project involved creating a real life object involving hardware

and it's also a wearable. While prototyping is extremely useful in envisioning the device and also see some hidden issues that might be more clearer in the real world, there are other aspects for consideration as well. As both these approaches are not that good in handling the problem of scope creep a lean approach involving prototypes can prove beneficial in regards to this project.

Lean methodology puts maximum emphasis on customer value and minimizing waste and production time. That seems to address the highlighted issue of wasted potential and lack of vision more closely than the other methodologies. But before discussing the lean methodology, a grasp of strategic project management is necessary since most of the adaptive models like agile, scrum and lean are all derived from strategic project management. Patanakul (2011) categorizes project management strategy into two, traditional and strategic approach. Traditional approach is the one where primary focus is solely on the single project and attaining its time and budget goals and its successful completion whereas strategic approach involves implementing "project strategy", the term itself is a bit ambiguous, however it means to have an action plan not only for meeting the project end results, but also to ultimately meet the business goals and customer satisfaction in the long run. Of the two, traditional approach is the more widely used and strategic is the unorthodox one while slowly gaining popularity. From the definition of the two, it can be suggested that the project Google Glass was likely following the traditional model of project management instead of strategic and that considerably surmounted to its eventual downfall. There is also the imbalance between the technical goals and business goals visible throughout the project life cycle which would be easily taken care of on following a more strategic method to project management.

2.3 Justified Business Objective

Patanakul (2011) describes that when following a traditional project management concept, where a project team and manager focus solely on the project itself and move forward with the mentality of simply "getting the job done" without actually considering the business results, failure is more likely to occur. And that is precise what engineers at Google seemed to have done during the Google Glass project. Google applied good marketing strategies at the beginning but they failed to realize the business prospect, identify their

target audience and could not even provide a proper use case for their device. There was a clear lack of scope as they hailed Google Glass to do be capable of doing almost everything, the consumer never really could make sense of what was it actually for. As discussed before, the product design itself was a huge blunder as well. An electronic device that was going to be on a user's head combined with a rectangular glass block so close to the eye looked hazardous to user's health. The fashion sense of the glass was not helping either. At the time, in technical forums and response websites there was a feedback statement being circulated that summarized the glass's failure quite precisely and it was that "people without prescription glasses do not want to wear glasses and people with glasses can not wear the google glass". Google did however address this issue in its later phases by incorporating a full framed glass version but it was too late.

Patankuli (2011) does stress that the strategic project management approach in no way intends to disregard the traditional approach but rather enhance or expand on pre established concepts provided by the traditional approach which is to say that the basics of time/cost/quality management hold their own importance but there are many other project management areas as well like stakeholder management, scope management and so forth that needs proper attention.

2.4 Methodologies and Management Approaches

As established so far, this research proposes Lean Management technique in combination with Six Sigma methodology. The lean approach establishes utmost priority for enhancing customer value which in turn leads to a good business result therefore ensuring project success. While doing so it also focuses on minimizing the waste by using fewer resources that contributes greatly to quality enhancement. This approach was pioneered and first used by the Japanese manufacturing industry and there are cases of many large companies like Ford and Toyota implementing it. This management approach helps to avoid underutilization of resources and also helps identify and remove services and features unwanted by the end user. The seven common Lean Six Sigma tools: 5S system, seven wastes, value stream mapping, kaizen, flow,

visual workspace, and voice of the customer are extremely efficient in project management.

In his book, “Lean Thinking”, Womack (1996), states that “Lean is doing more with less”. He elaborates that this approach helps to give the customers exactly what they want while making minimum or optimum use of available resources and not over allocating any segments. Five principle are to be followed as per the lean approach that are

- **Specifying Value** from the customer’s perspective.
- Identification of **Value Stream** i.e. how the product should be delivered or introduced to the customer.
- Maintain a proper **flow** by eliminating any unnecessary departments, processes or features.
- Follow a **pull** approach that suggests manufacture as demanded or do build per request
- **Pursue Perfection** by a never ending revision and analysis of reducing time, cost, space and mistakes. It implies that attaining perfection is a continuous process rather than being a set of specific steps to be followed once.

To attain each of these principles various tools of strategic project management techniques will be suggested and detailed in the upcoming segment.

2.5 Detailed Strategy/Solution

Six Sigma methodology helps in reducing process variation and gaining process control while the lean process helps in filtering out the non-value components, features or processes in a project and when combined promote work standardization and flow. A brief case study by American Society of Quality (ASQ) defines Lean Six Sigma as “a fact-based, data-driven philosophy of improvement that values defect prevention over defect detection (ASQ, 2019). It drives customer satisfaction and bottom-line results by reducing variation, waste, and cycle time, while promoting the use of work standardization and flow, thereby creating a competitive advantage”.

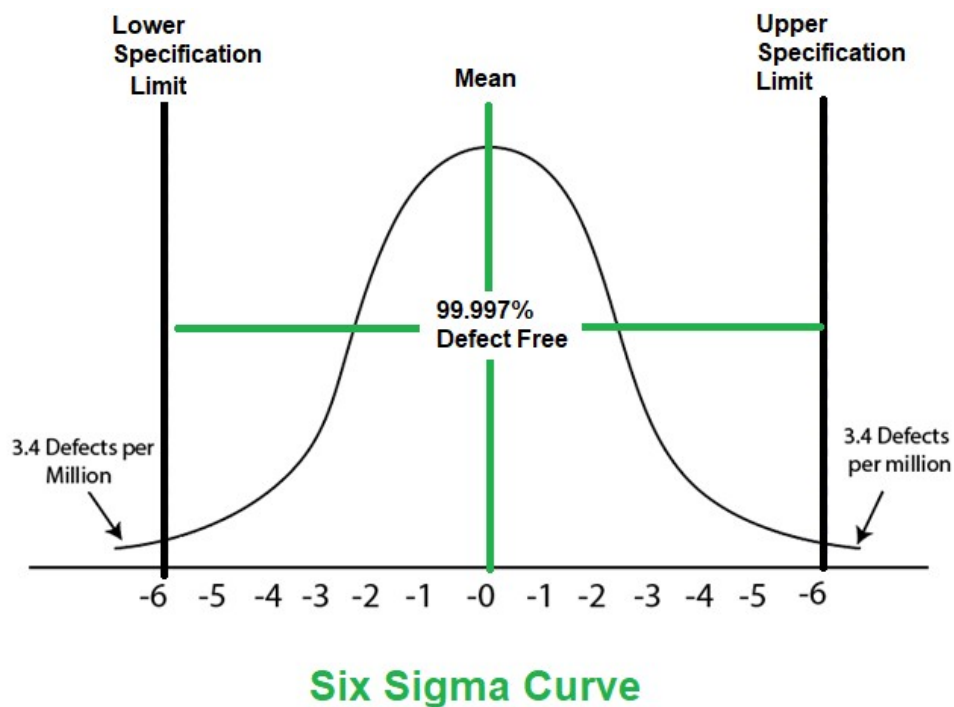


Illustration 3: Image courtesy: from geeksforgeeks.org

This strategy if applied properly could ensure the success of ambitious project like google glass and as part of this strategy following project management tools are considered.

- **Scope Management:**

In order to properly specify value and understand the customer's requirements proper scope management will have to be in place. Google never marketed the products use case as being specific which resulted in the problem of scope creep and points to the problem where users could not figure out what specific purpose would the google glass be used for. To solve this, proper scope management should be implemented from the very beginning stages of the project. This involves several approaches like survey, interview of focus groups, questionnaires and prototype testing suitable for this case. Proper preliminary analysis along with project management tools like proper work breakdown structure and requirements management plan will play a very important role in reducing the probability of scope creep. The defining stage of the five phase improvement process of six sigma known as DMAIC (define, measure, analyze,

improve and control) method will help in scope definition as well quality management that will be discussed in later part of this section. DMADV is another Six Sigma Methodology which involves five steps: define, measure, analyze, design and verify, all when used in coordination are useful for new product design and best fits for the case of Google Glass. Example of tools based on Quality Function Deployment(QFD) like house of quality and Gantt Chart are showcased below as project management tools that helps establish proper project scope.

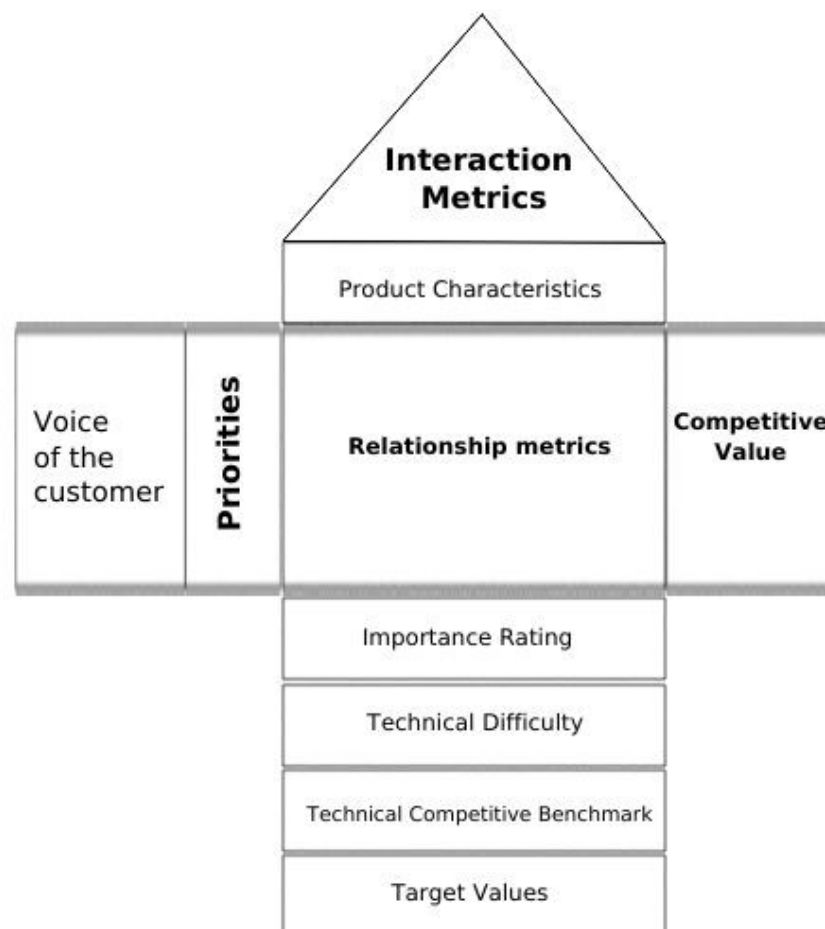


Illustration 4:Quality Function Deployment - House of Quality

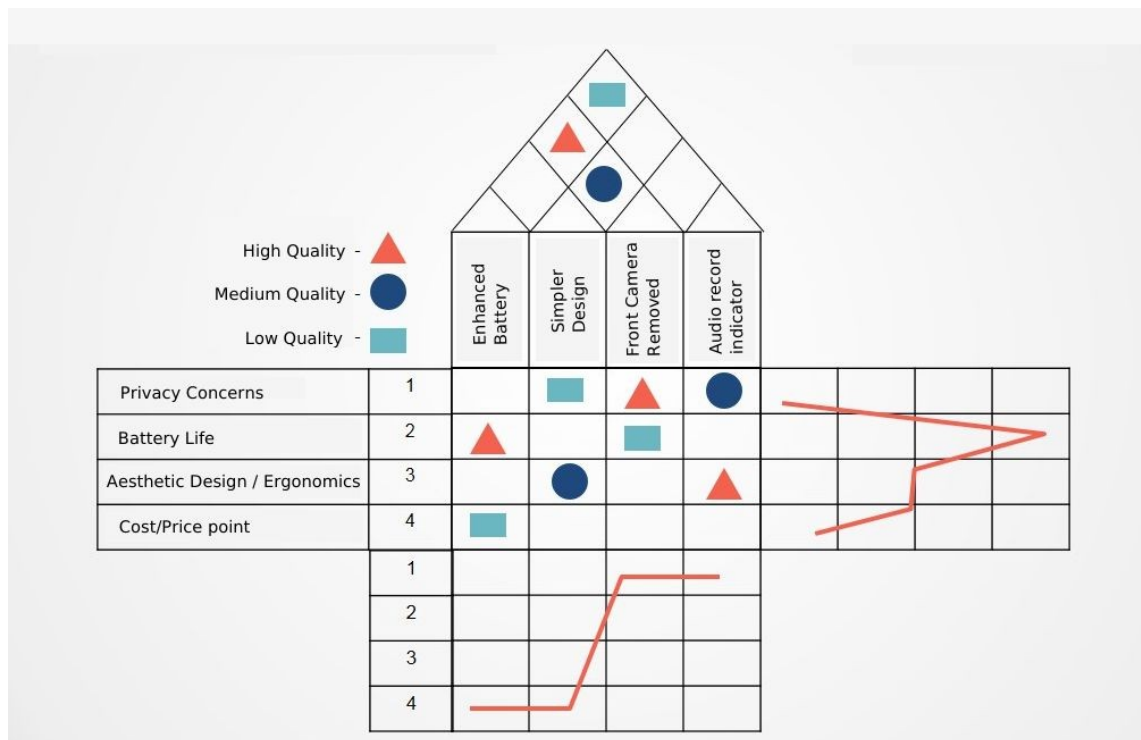


Illustration 5: Detailed Example of HOQ – Image courtesy: slidemodel.com

Task lists example for preparation of Gantt Chart as follows:

		Name	Duration	Start	Finish
1		Google Glass Project	472 days	4/22/12, 8:00 AM	2/11/14, 5:00 PM
2		Case Studies and Requirements Analysis	35 days	4/22/12, 8:00 AM	6/8/12, 5:00 PM
3		Case Study of ICT based Wearables	35 days	4/22/12, 8:00 AM	6/8/12, 5:00 PM
4		Augmented Eyewears and benefits	15 days	5/15/12, 8:00 AM	6/4/12, 5:00 PM
5		Existing technologies	7 days	5/28/12, 8:00 AM	6/5/12, 5:00 PM
6		Consumer Analysis	38 days	6/8/12, 8:00 AM	7/31/12, 5:00 PM
7		Focus Group Analysis	14 days	6/8/12, 8:00 AM	6/27/12, 5:00 PM
8		Surveys in Tech Groups	24 days	6/28/12, 8:00 AM	7/31/12, 5:00 PM
9		Questionnaires involving use of tech wearables	7 days	6/28/12, 8:00 AM	7/6/12, 5:00 PM
10		Observations from dev community	5 days	7/6/12, 5:00 PM	7/13/12, 5:00 PM
11		Scope Definition	10 days	7/31/12, 8:00 AM	8/13/12, 5:00 PM
12		Product Characteristics	7 days	8/13/12, 8:00 AM	8/21/12, 5:00 PM
13		Prototype Development	137 days	8/21/12, 8:00 AM	2/27/13, 5:00 PM
14		Design engineering	30 days	8/21/12, 8:00 AM	10/1/12, 5:00 PM
15		Components assembly	15 days	10/1/12, 8:00 AM	10/19/12, 5:00 PM
16		Functionality Test	30 days	10/22/12, 8:00 AM	11/30/12, 5:00 PM
17		Bug Fixes and Refinement	15 days	11/30/12, 8:00 AM	12/20/12, 5:00 PM
18		Prototype Ready	1 day	12/1/12, 8:00 AM	12/3/12, 5:00 PM
19		Alpha Testing and Improvements	50 days	12/20/12, 8:00 AM	2/27/13, 5:00 PM
20		Product Development	149 days	2/27/13, 8:00 AM	9/23/13, 5:00 PM
21		Design Refinements	50 days	2/27/13, 8:00 AM	5/7/13, 5:00 PM
22		Hardware Improvements	50 days	5/7/13, 8:00 AM	7/15/13, 5:00 PM
23		Integration and Testing	50 days	7/15/13, 5:00 PM	9/23/13, 5:00 PM
24		Beta Testing	50 days	9/23/13, 8:00 AM	11/29/13, 5:00 PM
25		Feedback analysis	7 days	11/29/13, 8:00 AM	12/9/13, 5:00 PM
26		Improvements	30 days	12/9/13, 8:00 AM	1/17/14, 5:00 PM
27		Buffer Duration	16 days	1/17/14, 8:00 AM	2/7/14, 5:00 PM
28		Final Launch	1 day	2/10/14, 8:00 AM	2/10/14, 5:00 PM

GoogleGlass-solution - page1

			Qtr 3, 2012			Qtr 4, 2012			Qtr 1, 2013			Qtr 2, 2013			Qtr 3, 2013			Qtr 4, 2013			Qtr 1, 2014		
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
GoogleGlass-solution - page1																							

The Gantt charts developed in the section above also serves for time and quality management. It is a very reliable tool for an overall outlook to how the project is supposed to be carried out and is subject to change or adjustment depending on the pacing of the project. Including the Gantt charts other useful tools like Network Diagram and Work Breakdown Structure can also prove to be extremely useful for proper monitoring and control of time and quality.

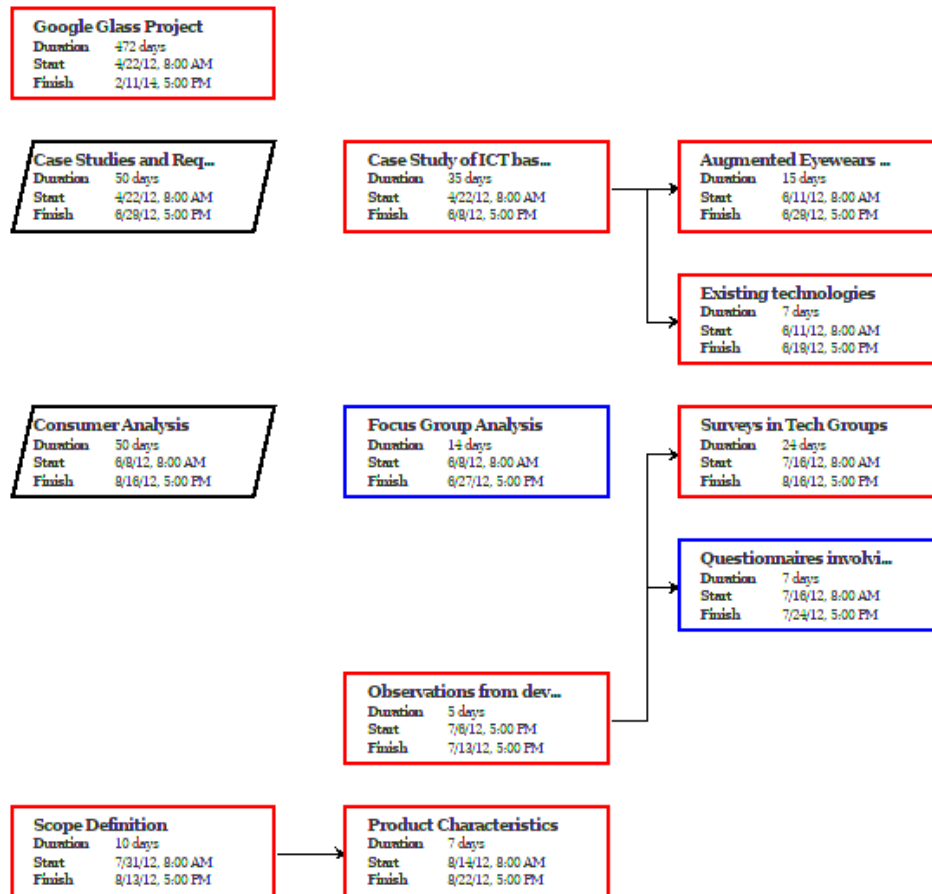


Illustration 6: Example of Network Diagram

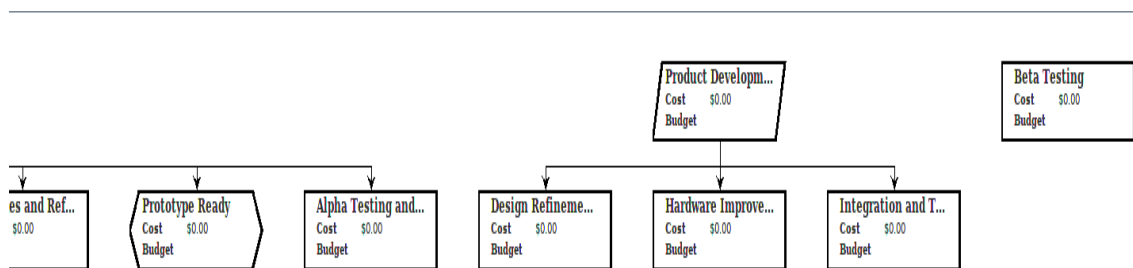


Illustration 7: Example of Work Breakdown Structure

- **Risk Management:**

As part of risk management this project should primarily focus on risk to the participants or the user and the device itself. Various risk factors can be outlined by using the Delphi technique, Risk Matrix, Cause-and-Effect matrix and similar techniques suggested by six sigma. A group of experts can make proper judgement and risk classification by using the risk register which can also be

useful for predicting risk or failures and implement precautionary measures accordingly. Some examples of risk identification in this particular case can be regarding the radiation the device may cause or other health hazards like seizures or vertigo as the google glass is meant to be routinely used by the users. Cases regarding fall and physical damages must also be outlined to ensure the product durability as well as minimizing injuries to user in case of collision while wearing the gadget. Proper leadership is also an integral part of risk control in six sigma approach. Activities management, data integrity, policy and procedures, information processing are some of the control activities that helps to ensure that risk control measures are in place and are reported timely when Six Sigma approach is being followed for risk management. When combined with proper communications management this can enable the process owners to dedicate their focus on improving the product with respect to customer satisfaction rather than simply attaining the project goals resulting in increased business value.

2.6 Conclusion

Ultimately, proper implementation and use of the lean management while following the Six Sigma methodology for strategic project management will ensure that the product meets the customers demand while making efficient use of resources. In the modern era simply focusing on the time, budget and quality and seeing to meet the project goal alone is not sufficient for achieving a successful result. Business results and consumer satisfaction are the additional areas that project management should address to ensure project success. Six Sigma methodology maximizes product quality while reducing the resource consumption during project life cycle and delivers a product that guarantees stakeholders satisfaction resulting in a successful project. Lean Six Sigma is not just a project management tool but is regarded as a principle in how a company or organisation operates so as to gain happy customers and thriving business results.

3 References

Klein, A., Sabino de Freitas, A., Pedron, C.D., Elaluf-Calderwood, S. (2015) *WHO IS AFRAID OF GOOGLE GLASS? MAPPING THE CONTROVERSY ABOUT WEARABLE AND UBIQUITOUS COMPUTING*, Paper presented at the Academy of Management Meeting – Vancouver – CA.

https://www.researchgate.net/profile/Amarolinda_Klein2/publication/291361926_Who_is_afraid_of_Google_Glass_Mapping_the_controversy_about_wearable_and_ubiquitous_computing/links/56a6851a08ae997e22ba49e0/Who-is-afraid-of-Google-Glass-Mapping-the-controversy

Silva, M., Freitas, D., Neto, E., Lins, C. Teichrieb, V. and Teixeira, J. (2014) *Glassist: Using Augmented Reality on Google Glass as an Aid to Classroom Management*. Proceedings - 2014 16th Symposium on Virtual and Augmented Reality, SVR 2014. 37-44. 10.1109/SVR.2014.41.

https://www.researchgate.net/publication/286119229_Glassist_Using_Augmented_Reality_on_Google_Glass_as_an_Aid_to_Classroom_Management

Patanakul, P. and Shenhar, A.J. (2012) *What Project Strategy Really Is: The Fundamental Building Block in Strategic Project Mangement*. Project Management Journal, Vol. 43, No. 1, 4–20, Wiley Online Library
<http://wileyonlinelibrary.com>. DOI: 10.1002/pmj.20282

Womack, J. & Jones, D. (1996) *Lean Thinking : Banish Waste and Create Wealth in Your Corporation*. 10.1038/sj.jors.2600967.

https://www.researchgate.net/publication/200657172_Lean_Thinking_Banish_Waste_and_Create_Wealth_in_Your_Corporation

Deshpande, S., Uplenchwar, G., Chaudhari, D.N. (2013) ‘Google Glass’, International Journal of Scientific & Engineering Research, Volume 4, Issue 12, ISSN 2229-5518 https://www.ijser.org/researchpaper/Google_Glass.pdf

Chowdhury, S.K. (2018) *Avoidance Attitudes towards Virtual Assistants*, presented to the Faculty of Health and Life Sciences , Coventry University.

https://www.researchgate.net/profile/Sandeep_Chowdhury/publication/325195832_Avoidance_Attitudes_towards_Virtual_Assistants/links/5afd7067a6fdcc3a5a4d4031/Avoidance-Attitudes-towards-Virtual-Assistants.pdf

O'Sullivan, J., (2015) *Augmented Life in the Public Sphere: A Case Study of Google Glass, Google Cardboard, and Google Now*. University of Dublin.

<https://www.scss.tcd.ie/publications/theses/diss/2015/TCD-SCSS-DISSERTATION-2015-042.pdf>

Leo, K. (2018) 'The Lessons of Google Glass: Aligning Key Benefits and Sociability'. 10.1007/978-3-319-92043-6_31.

https://www.researchgate.net/publication/325599499_The_Lessons_of_Google_Glass_Aligning_Key_Benefits_and_Sociability

Martinez-Millana, A., Bayo-Monton, J. L., Lizondo, A., Fernandez-Llatas, C., & Traver, V. (2016) *Evaluation of Google Glass Technical Limitations on Their Integration in Medical Systems*. *Sensors* .(Basel, Switzerland), 16(12), 2142. doi:10.3390/s16122142

WEB REFERENCES:

J. Leroy Ward. (2011) 'The Top Ten Project Management Trends for 2011'. projecttimes.com

<https://www.projecttimes.com/articles/top-10-project-management-trends-for-2011.html>

<https://www.lean.org/WhatsLean/>

<https://www.pocket-lint.com/ar-vr/news/google/132399-google-glass-a-brief-history>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5191122/>

<https://asq.org/quality-resources/qfd-quality-function-deployment>

<https://slidemodel.com/templates/house-quality-powerpoint-template/>

<https://asq.org/quality-resources/six-sigma#Case%20Studies>

<https://www.geeksforgeeks.org/six-sigma-in-software-engineering/>