APPENDIX

Entrepreneurs and Accountants **Vision 2025**

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Appendix A1

Final Context Factors

SN	Context Factor	Type (ViP)	Type (HBT)
1	People like to receive information in real-time	Principle	Human
2	Technology Startups have different information needs than other companies	Principle	Business
3	Machines can recognize human speech and are improving	Development	Technology
4	Accountants prefer to have face to face interactions with their clients	State	Business
5	Startup Entrepreneurs are obsessed about building their team	Principle	Business
6	Large scale collaboration enables people to create magnificent, monumental things	Principle	Human
7	Information overload leads to poor decision making	Principle	Human
8	People want absolute certainty in their financial transactions	State	Human
9	Entrepreneurs are anxious about Accounting Laws because they want to avoid trouble with government	State	Business
10	Good Entrepreneurs are always thinking about how to grow their business	State	Business
11	Current common digital tools lack the 'personal touch' of phone calls or face-to-face meetings	State	Technology
12	Entrepreneurs trust their accountants 'slavishly'	Development	Business
13	Entrepreneurs do not spend much energy and time in finding the right accountant	State	Business
14	Seeing multiple aspects of a business in one place creates new insights.	Principle	Human
15	Machines are getting better at recognizing human faces accurately	Development	Technology
16	The number of companies in the world is growing	Development	Business
17	People want to feel freedom and control in their life.	Principle	Human
18	People want to pursue personal growth, exploration, and learning	Principle	Human
19	Accounting takes more than 7 years of professional training - academic and practical	State	Business
20	People are not good at telling exactly 'why' they like or dislike something	Principle	Human
21	Data is exploding on all fronts	Development	Technology
22	Machines are becoming increasingly better at making predictions in all walks of life by understanding hidden patterns in data	Development	Technology
23	Technology becomes cheaper in the long term	Principle	Business
24	People do not like intermediaries, middlemen, or third-parties	Principle	Human
25	We like products which are both typical of a category and novel	Principle	Human
26	Luxuries of today become necessities of tomorrow	Principle	Human
27	Networks create value for both individuals and companies	Principle	Business
28	In a complex world, we aggressively filter information using heuristics	State	Human
29	Bizarre, Funny and Visually Striking things capture human attention	Principle	Human
30	Trust is an extremely valuable commodity	Principle	Human
31	People make errors of judgement from finding stories in sparse data	Principle	Human
32	People like to carve out their unique identity through their choices	Principle	Human
33	Entrepreneurs and Accountant seek a 'click' with each other	State	Business
34	People value the feeling of security which comes from being part of a community	Principle	Human
35	People are willing to give away data for convenience which comes from personalization	Trend	Human
36	Business opportunities can come from areas which the entrepreneur cannot even think about	Development	Business
37	Machines can detect emotions and personality from text typed by a person	Development	Technology
38	Machines can detect emotions from photographs of people's faces	Development	Technology

SN	Context Factor	Type (ViP)	Type (HBT)
39	People like tools which they can adapt according to their wish and needs	Principle	Human
40	People prefer 'rich' (audio or visual) media content over text content	Principle	Human
41	Number of small sized companies (less employees) is rising	Development	Business
42	There are multiple solutions to every business problem	Principle	Business
43	Our faces, voice, language patterns and typing patterns have a unique 'fingerprint'	Principle	Human
44	Different business structures have different growth priorities	Principle	Business
45	Larger samples of data are less prone to variation and error	Principle	Technology
46	Interpretations of an event affect our emotions and experience about the event	Principle	Human
47	Good mood makes people more creative, and less careful	Principle	Human
48	People like to interact with 'personalities' and not 'dumb' machines	Principle	Human
49	People assign much greater importance to the first number they see in any context	Principle	Human
50	Seeing multiple options for a decision makes logic dominate intuition	Principle	Human
51	People are realizing the value of data-driven decision making	Development	Business
52	Small mistakes with feedback help in making right decisions	Principle	Business
53	People are becoming smarter, faster and better, that is, more productive	Development	Business
54	Economic value is created by bundling and un-bundling services and products	Principle	Business
55	People like to try things out before committing to them	Principle	Human
56	People like to be 'first to arrive' at key events	Principle	Human
57	People find it painful to change their habit patterns	Principle	Human
58	People are comforted by the feeling of having enough options at hand	Principle	Human
59	People from outside a field can sometimes give better solutions than the experts	Principle	Business
60	In practice, complete contracts are not possible	Principle	Business
61	People like to deal with people they know and trust	Principle	Human
62	Value of human experience is increasing	Development	Human
63	People like to discover 'hidden gems'	Principle	Human
64	Network effects' dominate the economics of most businesses today	Development	Business
65	Centaurs (Human + AI) create the best combinations for performance	Development	Business
66	People define themselves by the work they do	Principle	Human
67	Machines can read our emotions as we look at screens and adapt content accordingly	Development	Technology
68	Personal devices are becoming interfaces to the cloud	Development	Technology
69	The world is moving from hierarchies to networks	Development	Business
70	A persistent identity is the foundation for trust in the online world	Principle	Human
71	Startup entrepreneurs are idealists - they believe in improbable futures	Principle	Business
72	Entrepreneurs trust their gut for making decisions about relationships	State	Business
73	Entrepreneurs approach accounting with a mixture of boredom, fear and delight	State	Business
74	Most SMEs and Startups have one specific co-founder taking care of the accounts, other focusing on sales or product	State	Business
75	Tax and legal language is not 'human readable'	State	Business
76	Accountant involvement increases in case of 'unforeseen events' for entrepreneurs	State	Business
77	Some entrepreneurs see Accountant as a 'sparring partner'	State	Business
78	Entrepreneurs don't know how much value the accountant adds to them	State	Business

SN	Context Factor	Type (ViP)	Type (HBT)
79	People are willing to pay for something when they know it has clear value for them	State	Human
80	Entrepreneurs face painful periods of financial 'gaps'	State	Business
81	Entrepreneurs value freedom more than financial safety	Principle	Business
82	Entrepreneurs want to create a personal impact on the world	Principle	Business
83	Accountants are flexible to 'real-time' demands of entrepreneurs	Development	Business
84	Some entrepreneurs have multiple lines of businesses	State	Business
85	Entrepreneurs tend to start companies with people they already know	State	Business
86	Entrepreneurs feel they never have enough time for strategic work	State	Business
87	Agency businesses face challenge of balancing the needs of clients and team	State	Business
88	People's cultural background influences their business priorities	Principle	Business
89	Entrepreneurs' areas of concern change as the company evolves	Principle	Business
90	Time pressure and deadlines create stress for entrepreneurs	Principle	Human
91	Accountants want to be accessible and are flexible with client demands	State	Business
92	Accountants prefer their clients to be geographically close	State	Business
93	Future entrepreneurs will be more demanding of accountants' time	Trend	Business
94	Accountants are always looking for new opportunities for their clients	State	Business
95	Accountant adapts to information needs of entrepreneurs	State	Business
96	Accountants worry about their advice not being listened to, hence they prefer phone or in-person meetings	State	Business
97	Accountants deeply care about Entrepreneurs	State	Business
98	Accountants wear many hats - coach, sparring partner, compliance checker	State	Business
99	Voice interfaces can provide much more flexibility than screens for some use cases	Development	Technology
100	Accountants need to remain updated with latest laws and regulations	State	Business
101	Face to Face contact is a rich source of information	Principle	Human
102	Accountant's tax expertise is a good source for finding opportunities to save money	State	Business
103	Accountant's experience helps to interpret their clients' unspoken needs	State	Business
104	More data about the customer can be used for designing a better user experience	Development	Technology
105	Data contains 'hidden properties' which can be brought out by predictive analysis	Development	Technology
106	Machines are getting better at understanding unstructured data from the real world	Development	Technology
107	It is more natural to speak out commands rather than typing them out	State	Technology
108	Human language is rich and complex with emotion, sarcasm, and context.	State	Human
109	To adapt to new technology, society evolves a system of checks and balances	Principle	Human
110	Governments want to be technology neutral and encourage innovation, but also to preserve public values	State	Human
111	People will have multiple streams of income aided by multiple currencies	Trend	Technology
112	Converting experience and emotions into data can provide opportunities to improve them	Principle	Technology
113	Human intelligence and experience is needed to ask the right questions to address problems	Principle	Technology
114	People with different personalities, backgrounds, and values find it difficult to communicate productively	Principle	Human
115	Our emotions are a rich source of information about our preferences and attitudes	Principle	Human
116	People with similar identities prefer similar content and products	Principle	Human

SN	Context Factor	Type (ViP)	Type (HBT)
117	Every business domain has its own valuable specialized knowledge understood by experts	Principle	Business
118	High quality work on basic accounting tasks forms foundation for valuable accounting advice	Principle	Business
119	There is a clear shortage of qualified accountants in the Dutch market	State	Business
120	Some accounting firms wait for others to experiment with new technology to avoid mistakes	State	Business
121	Entrepreneurs want accountants to add value through proactive advice	State	Business
122	Avenues of recovery make people more confident in trying unfamiliar things	Principle	Human
123	In a rapidly changing world, speed of execution becomes critical factor of success	Principle	Business
124	People like to speculate about the future	Principle	Human
125	People like to be a part of fantasy worlds	Principle	Human
126	New technological innovations create the need for having new laws and regulations	Principle	Technology
127	People value transparency in their transactions	Principle	Human
128	People cherish the feeling of being understood	Principle	Human
129	People like to contribute to their community	Principle	Human

Note

This Section presents only the final context factors which were filtered out from the Broader set of context factors. The list of approximately 1300 broad context factors can be viewed online on the link below,

https://docs.google.com/spreadsheets/d/1KkjjSgwer-goFLQ1it6RnZwgB3sj-WaGiFRSEBeeKak/edit?usp=sharing

Appendix A2

Interview Formats

A2.1 Interview format for Entrepreneurs

Entrepreneur Interview - Introduction

Tell me something about the origin of your business
How long have you been in business?
What motivated you to go into business?

What are the top 2 areas where you devote your energy to ensure growth of your business?

What is your #1 worry about your business?

What are your day-to-day challenges in business?

Where do you rely most on your intuition?
Where do you rely most on data?

What do you see as key opportunities for your business?
How do you keep recognize opportunities?
How do you separate the relevant from all else?
Technology / market / newsletters / other..

What is your long term vision about your business?

Entrepreneur Interview - Accounting

How would you describe your relationship with Accountant?
Friendly / Intimate/ Transactional / Routine / Burdensome / Intense / Other

How did you choose your accountant? Why did you choose him or her? How satisfied are you with your choice? Why?

What bothers you about your accountant? How could it be changed?
What do you wish your accountant understood better?

How often do you contact your accountant? How many times in a month?
In which month do you contact accountant more? Why?

Do you communicate with the accountant directly or through some employee? When do you communicate directly, and why?

What is your preferred way of communication?
Which is your least preferred way? Why?
Phone/ Mail / In-person /

Do your modes of communication change with tasks?
urgency/ importance / other factors

Tell me a story about where your accountant helped you in a significant way.
How did it happen? How was it resolved? What did you learn from it?

A2.2 Interview format for Accountants

Accountant Interview - Communication

How would you describe your relationship with Entrepreneurs?
Friendly / Intimate/ Transactional / Routine / Burdensome / Intense / Other

What is your most preferred way of communication?
Which is your least preferred way? Why?
Phone/ Mail / In-person/ E-mail / WhatsApp

What is common among the good Entrepreneurs you work with?

What is common among those you don't like? What are the most common causes of friction? How do you resolve these?

Tell me a story about miscommunication with a client
How did it happen? How was it resolved? What did you learn from it?

What steps do you take to prevent miscommunication?

What do you wish Entrepreneurs knew?
What do you wish they *did*?

Accountant Interview - Value and Future

What value do you provide? Why do Entrepreneurs choose you?
Why should they choose you?

How do you ensure you are delivering the best value?

How do you make a client feel special?

What are the biggest challenges and threat to your business?
Competition / Technology /Other

How are you preparing for the future?
New Business Segments / Tech. Investments / other..

A2.3 Interview format for Expert 1

Overall Trends / General

- There are a lot of key trends in the ICT Technology right now, there is a growth of interest in Machine Learning, there is increased connectivity, and there is the blockchain. Which of these technologies do you see as most transformative for society and business? Why?
- Are there any historical examples (like the internet) which can help us answer this question?
- Generally, what are the time-scales involved in large-scale adoption of technology?
- What macro socio-economic forces are shaping the development of ICT technologies? Do these have a direction? What direction is it?
- Blockchain may enable P2P lending which is free of Trusted Third Parties. How do you think this will evolve over time? Is it practically possible to do away with all regulation? What are the challenges? What are things which would not happen?
- How can a designer/entrepreneur filter out the signal from the noise? What parameter should guide a company (or self-selected individuals) in development of and investments in, technology?

Regulations

- How are regulations shaped around these technologies and how do the technologies themselves shape the regulations?
- Can the existing regulatory framework help business leaders in predicting which technologies will dominate in the future? How?
- How does Dutch regulatory system differ significantly versus the international regulatory system? What have been the gains and losses of strong regulatory standpoints on technology?
- Are there any business or societal needs which are served better by larger regulatory entities than bottom-up innovation? Can you give me an example?
- How do regulators react when they see a potential new technology on the horizon? What key principles are taken to account - to help them decide on the implementation. Can you give me an example?

Design

- What separates successful bottom-up platforms from the unsuccessful ones? How can we 'design' a successful platform?
- Can you tell me about the general design principles to match the self-organizing systems which would be especially relevant to the field of accounting and financial management?
- How are peer-to-peer systems structured? Wikipedia and Open source movement also have some central control - key moderators. Can you tell me more about the structures which work and those which do not work?
- What entrepreneurial traits are necessary for taking advantage of new technologies?
- Are there some areas of business which gain more using these? Are there areas which gain less? Which ones are these?

A2.4 Interview format for Experts 2, 4 and 5 (all have expertise in ML)

About Technology in General

- Can you tell me a bit about ML/NLP in general and your research in particular? From a beginner point of view?
- What are the most common current applications of Machine Learning?
- Which current products are using the best AI?
- What parts of ML and AI are a bit on the hype side? More hype than substance?
- Can you tell me more about NLP and voice interfaces? What is your view on NLP and Voice Interfaces? What are the challenges faced there? When do you think the challenges will be overcome?

Technology Deeper

- Can you elaborate a bit on some other areas - like reinforcement learning, deep learning .. etc. With some simple examples?

Technology and User Experience

- You have worked on Multimedia and Technology and user experience of videos, can you tell me how ML\ NLP advances can help in building a better User Experience? What are your views and findings?
- What are the breakthroughs in Cognitive Sciences which will guide the creation of products in the future? Which principles can lead to surprisingly better products and services?

Technology and Usage Trends - what happens in the future 10 years from now?

- On a 10 year horizon, how would ML change? What technology trends are driving this? (For example, growth in GPUs, data)
- Are there any other global trends which will significantly impact development of technology?
- What are the barriers to these trends?
- Are there any opposing trends? Are there any reinforcing trends?
- What are the most worrisome trends from researcher's perspectives?
- What could be the most common future applications of Machine Learning?
- How do you think will multimedia consumption change? What will users in the future want more of?

Technology and Business

- Which parts of a businesses, and which businesses do you think will be affected the most with advances in Machine Learning? Which parts will be mostly immune? Why?
- How is the ML field evolving? What are the theoretical breakthroughs which are yet to be made in reality?
- What are the problems which are particularly hard or expensive to solve?
- What are some key business tasks which cannot be done, even with state-of-the-art machine learning?
- Which size of businesses will be most impacted? How can small players gain? How can big players gain?
- Can you tell me some examples of companies or applications which have used ML in an innovative way? Something which stands out? Something which surprised you?

Technology and Exact and Accounting Business (For experts 2 & 5)

- A bit more in detail about your role and goals here at Exact?
- How do you think Machine Learning can make a difference to accounting? Both from and SME as well as an Accountant perspective?

Thanks a lot for your time. Anything else you would like to add? Any reading list you recommend?

A2.5 Interview format for Expert 3

Predicting the Future

- VCs are in the business of predicting the future. How do you select which versions of the future will play out?
- Which current technologies do you see as having the most impact? Why?
- Which areas of technologies do you think are overhyped? Why?
- How do you separate the signal from the noise?
- How do you structure your portfolio around technologies?
- If technology was the only lever you would think of, all other things being equal (market size, industry, etc.) which technology would you invest in? Why?
- What are some global macro-economic trends which help you in prediction?
- What regulatory challenges do you see in adoption of technology?

Product Insights

- Can you give me some ideas around which products leverage technologies best? What patterns have you caught from successful products? Can you give me an example?
- Similarly, how do you identify companies which leverage technologies best? What are the markers for successful companies? Examples?

A2.6 Interview format for Expert 6

About Intuit

- Can you tell me about how the product teams are organized in intuit?
- What are they key success metrics?
- How do you discover latent customer needs?
- What are the processes followed?
- Can you tell me a story about a product or customer challenge you faced and how did you overcome it?
- It's okay to tell more about desktop software as well as quickbooks
- Can you tell me about the UX processes at intuit? Have you tried some? What has worked, and what has not worked?

About The Industry

- Where do you think this industry is headed?
- What are some underlying factors beneath? What will change in the coming decade? What will not change?
- Who are the new and competitive players in the industry? What is giving them an advantage?
- If Intuit is disrupted by a startup, what will that startup look like? What could be it's advantage?
- What are the biggest challenges faced by the industry as a whole?

About the future trends

- What changes are on horizon for the next decade?
- How is intuit preparing for them?
- Is there any key trend which you think intuit might be ignoring? And some competitor getting it?
- Which technologies are most important in this field, or at intuit, and how are you looking to leverage them?

A2.7 Interview format for Expert 7

General Introduction - Company

- You have been with of Exact for more than 5 years now, how do you think the industry has evolved in these years? What is next for the industry in terms of market trends? How has the customer evolved?
- Exact has had a the transformation to Cloud Solutions in the last few years, quite successfully, what are the lessons you took away? How are you applying the lessons to the future? Could the business model change with new technologies?
- What are the top 2 challenges facing Exact today? How is Exact dealing with them?
- What are the top 2 areas where Exact is investing the most resources? Why? Are there areas where Exact has stopped spending in last few years? Why?
- Exact has gone from a public company to a private one. How have your priorities changed due to this? It's ~3 years since APAX acquired Exact, how have things changed now, are they looking for an exit soon?
- Which one initiative in Exact are you most excited about?
- How are you leveraging Machine Learning to increase LTV of customers?

Competition

- Exact is a global leader in cloud accounting, but there are competitive threats. Which companies does Exact see as the biggest threats?
- If a startup disrupts the accounting world, what will the startup look like? Which market gap will it address, which the incumbents are ignoring? Or, will it be driven by technology?
- Exact is dominant in the Dutch market, but not so in other markets like Germany. What is Exact doing to address this? Which markets are seen as strategic for growth and why? Which competitors are potentially ignoring opportunities which Exact can see?
- If Exact acquires a company, what will that acquisition look like? What kind of company will make a good acquisition target for Exact?

Customers

- What are the key drivers of LTV in this industry? Doesn't cloud make churn a bigger problem?
- How does Exact lower it's CAC? Where do the most profitable customers come from? How does Exact ensure it gets those customers?
- Many accountants are still local in their approach. What is Exact doing to empower them - how will Exact give them a bigger reach and audience?
- The future may see a disproportionate growth in start-ups. How is Exact addressing this market? Do you plan to launch any startup specific products? (this might also help in addressing a more global market) - Sage has such a product.

Product

- In terms of UX, EOL is currently not the best product on the market, compared to competition like Xero and Intuit, how is Exact addressing this? What role does UX play in the growth of the business? Is Marketing more important than UX in this business? How are things changing?
- Most big businesses today rely on a platform based business model. How is Exact looking to leverage the power of platforms? Apart from Exact Connect? What is your vision on this? Does this industry present opportunities for creating platforms and marketplaces?
- There has been a trend in crowdsourcing to improve products (even in manufacturing), has Exact looked at this? Is it possible to bring the intelligence of the crowd into creating products?
- What are the structured mechanisms used by Exact to bring in intelligence from outside the company? How has Exact experimented with this?
- Many companies grow by looking at metrics and data where others are not looking (Snapchat v/s Facebook 'likes'). What sources of data do you think is Exact not capturing right now? How do you think these can or should be captured? What initiatives are you planning to capture these data?

Appendix A3

Exercises in Deconstruction

At the start of the project, I deconstructed some familiar products in terms of their product qualities, interaction qualities, and context factors. This was to train myself in viewing products with a new lens. The context factors also helped me in the final design.

Post-it Notes

Product Qualities

- Light
- Informal
- Pastel Colored
- Flexible
- Paper-y
- Smooth
- Simple
- Minimal
- Easy
- Relaxed
- Happy
- Pocket-able
- Sticky
- Glue-y
- Bendable
- Cuttable
- Foldable

Interaction Qualities

- Flexibility when moving notes around
- Creating an infinite amount of ideas with writing/ drawing
- Energy (when putting them on a wall)
- Constrained (when writing on a note)
- Careful Consideration - when you are drawing on it
- Carefulness - when making a to-do list on it
- Like a toy - can be cut/bent, is colorful
- Informality - you can just take a new note if old is messed
- Like building something
- Forgiving
- Like Lego Bricks - for ideas

Context Factors

- Innovation is important
- Ideation is important
- Having a lot of ideas matters
- Connecting ideas is important
- People value creativity
- Playfulness can lead to good ideas
- Basic needs of society are met, so people focus on creating more delightful products
- The world has a lot of distractions and choices - hence we need careful to-do lists which attract our attention from the noise.
- In a distracted age, focus becomes a very important quality

Magic Mouse (by Apple)

Product Qualities

- White
- Light
- Handy (fits in one hand)
- Glassy
- Durable - due to glass, rubber surfaces wear out
- Smooth - both from top and bottom; slide-y
- Clean
- Minimal - no decoration
- Wireless (via bluetooth)
- Symmetrical
- Looks like a hockey puck
- Clickable (on both right and left sides)
- Reflective
- Not much worn with time - Durable
- High-tech, but has no high-tech affordances
- Luxury
- Curved
- Inviting
- Space-Age-like, Futuristic
- Has a single on-off switch (at the bottom)
- Connects to another product (Mac)
- Depends on another product

Interaction Qualities

- Intimate - fits in hand
- The interaction can be characterised by focus.
- Control (used to control the pointer on the screen)
- Ephemeral / Invisible (you tend to forget that you are using it, especially in a state of flow)
- Meditative / Unconscious
- Like a skilled.. Pianist? The instrument dissolves and total focus is on the creation. You press the keys (buttons) - but that is almost automatic.

Context Factors

- Productivity is important, this is a tool for creation.
- People give tremendous importance to work.
- Tools which let the creator enter a state of flow - are the most useful for productivity.
- Technology is ‘covered’ by design. The outside of a product should appeal to human emotions, while the inside ‘does the job’.

- People like devices which get out of their way.
- People feel scared of technology. (Hence a friendly and inviting shape). This can also be seen in apocalyptic, 'robot takes over' movies, like the Terminator.
- People like devices which are friendly and inviting.
- People value minimalism, they want something which lets them focus.

Highlighter Pen (Faber Castell)

Product Qualities

- Light
- Small
- Fluorescent color + ink
- Inky
- Has a Clip (Clippy)
- Smooth edges
- Friendly
- Snappy (sounds when you open and close it)
- Handy
- Soothing sound when it is rolled on paper
- Bright, attractive

Interaction Qualities

- Focus, attention.
- The interaction can be characterised by cognitive effort. The user is processing the written material in a book and marking those which he thinks are important.
- Command - like a commander who directs attention using a clicker or a pointing finger (esp. When used on envelopes)
- The interaction can be characterised by filtering.
- Marking something for future reference or retrieval. Saving for future reference.
- Like 'adding to cart' or 'wishlist' for an ecommerce website. You can look at it again, and this time you don't need to see the whole thing again.
- Like 'liking' a tweet or 'bookmarking' on Medium - you can look at it later.
- Fluorescence can be like 'coming into light' from darkness. Interaction can be characterised by bringing secrets from darkness to light. (this particular interaction quality would not emerge in marking with a ball-point pen)
- Interaction can be characterised by 'treasure hunting'
- 'Code breaking'

Context Factors

- The world has too much distracting or irrelevant information. Hence, this is a tool to command attention by filtering information.
- Even though the world is digital, a lot of the work is done using paper - people feel comfortable reading and marking on paper.
- People want to prioritize information.
- People want to save energy, specifically mental energy. They don't want to do the filtering of the whole thing again and again.
- People (students) want to 'capture' as many ideas as possible.
- Fluorescent colors attract human attention.
- People do not like duplication of effort.
- Some ideas are more important than others. They form the 'core'. People like to focus on the core.

Tissue Paper Dispenser

Product Qualities

- Silver Color
- Reflective
- Smooth
- Friendly
- Classy
- Rounded Edges
- Independent 'box' (not on a wall)
- Pick-able
- Transparent Side edge
- Can hold a bundle of tissues
- Tissues taken from the top
- One tissue at a time
- Minimal

Interaction Qualities

- Hurried - there is a lot of rush after the food is taken from the counter.
- Control; you just 'pluck' it, 'pluck-ish'. A bit like plucking fruits from trees/plants.
- Momentariness - the user is expected to just take the thing and move on.
- 'Infinite-ness' - the tissues just keep on coming, almost endlessly. When one is gone, it is replaced by another - like a stream of tissues.

Context Factors

- People eat in public places. Food is available at the place where they work. People eat at places where they work.
- People like to wipe their hands after eating.
- People are in a hurry.
- People do not like to make a mess when dealing with food.

Open Plan Office

Product Qualities

- Open
- Windows to outside
- Rows of threes
- Lot of Chairs
- Rows 'back-to-back'
- Special Meeting Rooms
- Screens and chairs for each row
- No designated seating

Interaction Qualities

- Informal-ness
- Lack of hierarchy; equality
- Open-ness
- Sense of belonging (sense of being in something 'together')
- Like being together on a ship, on a voyage
- Windows give a feeling of being a part of the world as a whole

Context Factors

- Teams are more important than individuals.
- Hierarchy in decision making is not valued. Good ideas can come from anywhere. Ideas are more important than who they are coming from.
- Communication needs to be fast, information needs to flow.
- People focus on thriving instead of surviving (command-and-control model).
- Egalitarianism is valued.
- People work in a sitting position.
- Tasks of individuals are clearly defined. Each one has a dedicated space.
- Most work happens on computers. (Very less work with analog devices, very few sketch-pens, books, etc.)
- People value the convenience of computers and other digital devices.
- Everyone is connected in the workplace.

Bus Stop Button

Product Qualities

- Red
- Plastic-y
- Mounted on a pole
- Thumb-sized
- Press-able / Push-able
- Protruding
- Fixed
- Handy
- Reachable
- Spherical
- Red on gray on red
- Conspicuous
- Audible cue on pressing
- Visual cue ('STOP') on pressing

Interaction Qualities

- Commanding / Controlling
- Ease
- Like controlling a huge thing with a small push. The opposite of launching a large rocket with a button (here you stop a large machine with a red button)
- 'Aggressive control'
- Secure - will not miss my stop
- In terms of security, it can be like 'a cry for help', a panic button, or an emergency call, like 911/112.
- 'Instant rescue'

Context Factors

- Individuality - every seat has this button. So every individual is cared for. There is no central button.
- Linked to safety. Doors become closed in a secure way (versus doors in India which remain open)
- A drive for efficiency - if no one presses the button (and no one is outside), the bus does not stop.
- Driver is not to be disturbed in his task. So, this minimizes their interaction. Respect for the driver's work, and need for him to focus. This in turn increases safety of the passengers.
- Culture places very high value on individual human life.
- People dislike noise. By minimizing interaction with driver, noise is reduced.
- High degree of trust. People trust each other. They rely on this signal.
- People respect each other's time. They respond to others' pleas for saving time. People value time, they see it as a limited quantity.

Dustbin in public spaces

Product Qualities

- Whitish-Gray in Color
- Smooth Edges
- Inviting

- Friendly
- Slanted Opening
- Different shape - it bottoms out, giving a feeling of a hand coming up.
- Solid
- Convenient
- Durable
- Fixed - mounted on a pole

Interaction Qualities

- Like 'offering' something, 'donating' for a better cause.
- 'Friendly Donation'
- It can also be like 'handing over' something.

Context Factors

- People believe in recycling, sustainability. People care for the earth.
- People like convenience.
- People like cleanliness.
- People care for their outside environment as much as they care about their inside environment (homes).
- People spend a lot of time outdoors.
- People see themselves as part of a whole community, and hence respect the community. They care for the community.
- People value health over entertainment, hence outdoors.
- People like the feeling of contribution / 'donation'

Health Tracking Device (Philips Watch)

Product Qualities

- Black
- Wearable
- Digital
- White text
- Many States
- 'Touchable'
- Scrollable (outline can be scrolled)
- Strappy
- Light
- Snappy
- Convenient
- Like a watch

Interaction Qualities

- The interaction is characterised by - 'Curiosity' and 'Interest' - for someone using it first time.
- It can be 'confidence' if the parameters are under control, or 'dismay' and 'alarm' if they are too high.
- It can be tenderness. 'Tender curiosity' - like when a child checks out a new toy.

Context Factors

- People are very careful about their health.
- People trust technology to measure their vitals.
- People believe in 'measurement leads to management'.
- People want to be 'always updated', or, 'instantly updated'
- People trust some corporations (Philips) with their personal data.
- People want to know how 'normal' they are.
- Enough people carry a smartphone (watch Software is on the phone)
- People want self-enhancement - to become 'better'

Bus Station (Delft Station)

Product Qualities

- Multiple rows
- One Shelter per row
- Around 10 people can stand on each platform
- Space for buses
- Entry in a bus from one side.
- Open
- Vast, expansive - you can see at all buses at any time. Sense of control. You can also quickly move from one platform to another.
- Digital Indicators for which bus will come when, and on which 'platform'
- Bus schedules on shelter
- Maps of routes on shelter
- Structured
- Efficient
- Flexibility/Flow
- Informative
- Timely / Punctual
- Local - traveling to work.

Interaction Qualities

- Interaction is characterised by 'patience'
- 'Transparency' / 'Immersion'
- Playground - you can choose any bus to go anywhere you want. Each platform is like a window on a website - which can take you to places you want. At every platform there is a map too. The city itself is the 'map' of the playground and you can use the buses to move at different points in the playground.

- Social aspect: 'Together but alone' / 'Alone in a crowd' - people are together in an open, social space, but they have clear objectives and do not talk at all.

Context Factors

- Accurate timings: people value predictability, dislike uncertainty.
- People like to be adaptable - can shift platforms.
- People don't like to talk when they are traveling to work. They value schedule and time. They don't want to be late to office.

City Centre (Delft)

Product Qualities

- Wide Open Spaces
- Shops near open spaces
- New shops in old buildings (Preserving the architecture)
- Towering Church
- Hundreds of years old architecture (~700)
- Lot of coffee shops
- Lot of shops with Memorabilia
- Bicycle parking spaces
- Yellow street lights
- Vintage
- Sepia-ish light orange coloring
- Brick-made buildings and ground
- Solid
- Classic
- Immersive
- Traditional
- Expansive
- Lack of bicycle lanes

Interaction Qualities

- Like 'Stepping into the past' with the amenities of the present.
- Like moving in a museum. Or like those rides in Disneyland which keep you safe with modern equipment but take you into a new world.
- Being connected to something larger than you, being a part of it. Being part of a large story.

Context Factors

- People value their past, and hence preserve it.
- People value that others value it - hence these places are also used as tourist magnets.
- People like a coherent sense of identity - hence priority of older buildings over the new ones.
- People like to relax, play and connect.
- People like to be a part of a larger whole.
- The past contains valuable lessons.

Gaming Mouse (Corsair)

Product Qualities

- Black Matte look
- Fluorescent Yellow lights (on left)
- Fluorescent Blue Lights (near grip)
- Intimidating
- Lot of buttons (14)
- Roller with grip
- Red (Glowing) Digits on buttons (numbered buttons)
- Handy
- Works on clicks and rolling
- Combines mouse and keyboard
- Configurable
- Logo of Pirates (brand name 'Corsair' means 'Pirate')
- Deeply intriguing and interesting
- Used to 'Aim' and 'Shoot'
- Ergonomic
- Expressive
- Aggressive
- Dominating
- Gripp-y

Interaction Qualities

- Like holding a high tech device. 'Privileged power'.
- Like holding a powerful and rare weapon, which you need to master.
- Like a sword only the worthy can hold.

Context Factors

- People have extreme drive for performance and control.
- People (Gamers) need to feel powerful and superior.
- People like to configure and customize tools to gain best performance and power. They know best what they need.
- Aggressive people want tools which reflect their aggression.
- People spend their time playing aggressive games.
- People like to be a part of alternative realities and feel powerful in these realities.
- People like to be a part of fantasy worlds.
- People want to actively participate in fantasy worlds.
- People like to express themselves through devices they own.
- People like to take a challenge.
- People like to feel like 'kings', 'rulers', 'conquerors' and 'pirates'

- People take games very seriously.
- People like battles. Fights which are zero-sum games.
- People have a safe outlet to express their violent desires/instincts.
- The real world is boring and does not allow outlets for combat and battle.
- People like to take on new/alternate identities.
- Sometimes new, alternate identities allow people to express their 'true self' - which the real world does not offer them.
- People enjoy immersive experiences, in which they are in control.
- People like to feel heroic.
- Video gaming is seen as a professional sport.
- Technology enables creation of advanced immersive new worlds.
- People like the feeling of danger, without actually being in danger. (Hence also amusement parks)

iBooks App (by Apple)

Product Qualities

-
- Digital
- Touch-able
- Mobile based
- Searchable - can search the text, as well as web or Wikipedia.
- Can change fonts
- Can change background color
- Can change text size
- Can slide to any page
- Can Highlight Text - with 5 different colors
- Can Underline Text
- Can adjust brightness
- Can see how many pages are left
- Can 'turn pages'
- Can Scroll
- Can Share parts of text
- Flexible (can change fonts, size, etc.)
- Has an on-screen keyboard
- Can bookmark pages
- Can create notes
- Is kept in a bookshelf
- Polite
- Clean
- Readable
- Fresh
- Simple
- Useful
- Beautiful (on a hi-res screen, the beauty of fonts comes through)

Interaction Qualities

- Like reading a book - with turning pages, highlighting and note-taking, this stands out. We almost forget that this is a program on a mini-computer, and not a book.
- The interaction can be characterised by - Immersion
- It is like, setting some parameters on autopilot, and then going on a cruise. You set the configuration, like fonts, brightness, etc. once and then you are on the immersive journey, just steering, cruising. You can always reset things in between the cruise.
- Highlighting can be like collecting gems during the cruise or expedition. You can then see these 'gems' in one place - the container of gems. This is different from physical books.

Context Factors

- People like to read, even when multi-media has exploded.
- People like to read on mobile/electronic devices.
- People want the same feeling of physical books on their mobile devices.
- People like focused, un-interrupted reading.
- People like beautiful typography.
- People read for pleasure. They want to enjoy reading.
- People like to carry their books with them. Physical books are hard to carry, digital books are not.
- People like to share interesting things which they have read.
- People like to read everywhere. At home, in bed, on trains, etc.
- People want to search for information faster.
- People trust Wikipedia as a source of information.
- People move and shift bases a lot, so a physical library is hard to maintain.
- Real estate is expensive - so physical space for books is reduced.
- People like to save money and space - digital books are cheaper than physical ones.
- People like stories.
- People cannot stand boredom.
- People want to escape into stories.
- People like to know how other people think and feel.
- Authors want to reach a large audience.
- Authors want to earn money for their work.
- The world has embraced the smartphone, and it has become the platform for many of their daily activities.
- People like to interact with text. They want to touch it, slide their finger on it, type next to it.
- People like to make progress, they like to see how far they have come, and how far they need to go, to 'finish' things.

Appendix A4

Reflections and Strategies for Students

A4.1 Getting the Project

Know What you Want

It helps if you know what are your strengths and which kind of company you want to graduate with. Since my strengths and interests lay in digital design rather than design of physical products, I was more keen for these companies. Also, think about whether you want to work more in a design consulting firm or a product-based firm. While the learning curve is faster in design consulting, there is potential for more impact in a product based company.

Apply Far and Wide

Once you know what you want, apply to as many companies as you can within your chosen area. Don't worry about rejections. The more you apply, the better the chances of getting a useful project. I had around 15 rejections, and I know people with around 40, who got very good projects.

Think Ahead

If you want to keep the option of working at the company, and if you are an expat, do have the look at the IND registered list of companies who can employ people from outside the EU. Many of the good design consulting companies cannot hire non-EU students because they cannot afford the legal investment required. You want to avoid the disappointment where you have a great result and relationship with the company and yet they cannot hire you due to legal hurdles.

Leverage Flexibility

While applying for graduation projects, also look at internship opportunities. Exact had opened up an internship opportunity, and not a graduation project. I applied for the internship, and after I was convinced of their offer, I said I wanted to do a graduation project. Thankfully, they were flexible and it was converted to a graduation project.

Learn Dutch

If you don't speak it, you will be at a significant disadvantage. Knowing even basic Dutch will let you connect to your potential company, colleagues and eventually customers. Get fluent with small talk and greetings. The internship opening at Exact underlined Dutch as a requirement, and while I was not fluent, I had joined classes and mentioned them. The management was kind enough to accommodate that.

Make Something for Them

During the interview with Exact, I found that the interviewer was not too much interested in my portfolio. He wanted to know what did I know about their business. To make an impact I had made a small chatbot prototype for Exact. Seeing its design, he was convinced I understood the business. While a lot of candidates would talk about their strengths, you will leave a solid impression if you actually design something for them.

A4.2 Chairs and Mentors

While this is a very subjective choice, I suggest try to approach people who can give you time and attention. You should like them personally and ideally have worked with them on previous projects. Of course consult your fellow students to get fine grained information about working styles. At the end, all chairs and mentors want your success, but you have to set and live up to the right expectations. At the end, it is your project.

A4.3 Triangulate Feedback

Talk to multiple sources within company, and outside to get feedback on your work. Good ideas can come from anywhere. I got feedback from my manager, other senior managers, other UX team members at exact, other graduates of TU Delft, as well as my friends in and outside TU Delft. This gave me a variety of perspectives, as well as got me into some informative debates.

But having regular feedback from your key stakeholders is very important to make sure you are on the right track.

A4.4 Managing Time

Beware of Vacations

I faced some troubles because of facing weeks of being alone with all of the stakeholders being on vacation (in July and August). But more than that, even when I tried to contact customers, most of them were on vacation too. So, try to avoid this period in general, but if you can't, well, read the next point.

Make the Most of it

In the slower time, I doubled down on my own learning. I used the lean time to read on the ViP design method and train myself on it. I found the exercise a lot of fun. I also read parts of the key books during this period, and enjoyed them.

Read while Traveling

I have also developed the habit of reading on my phone. Paper feels great but phone can also work if you practice a few months for it. Hence, while I traveled to meet customers, I highlighted parts from the key books while sitting in trains and trams. This saved me a lot of time later.

People are Busy

If you want to interview customers, realize that most will never reply. So, try to reach 20 when you want one. Same with all other sorts of people you want to meet. Don't lose hope and adjust to it by simply increasing your number of attempts. While different people have different views, in my experience, calling people works better than e-mailing them. At least you know when they say 'No'.

In general build redundancies in your schedule. Whatever you plan, it will probably take longer.

A4.5 The Toolkit

Research Tools

I used Evernote, Google Docs, and Google Sheets. I scanned all my notes into Evernote and highlighted them. This was useful later when searching for relevant information and small tips. I also recorded all interviews using my smartphone and uploaded them on Evernote. Google Docs helped in sharing the report online with friends to get feedback. Google Sheets was very useful in collection and classification of context factors.

All these tools are cloud based. I faced the problem of having my laptop screen broken and had to submit it for repairing for 5 days. But since all my data was on the cloud, I was able to work uninterrupted from TU Delft computers.

Ideation and Visualization Tools

For raw ideation, I used good old pen and paper with post-its at times. Low fidelity tools are best for thinking freely. For making visuals, I used Sketch 3 as well as Keynote. Keynote was useful in presenting ideas to company mentor, while Sketch was useful for all sorts of visuals. For prototyping, I used InVision which was very helpful in quickly linking the screens. Also, I tried to have printed copies of visuals showing my broad approach - when communicating with key stakeholders. This gave a better grounding to discussions. I also used coggle.it for making mind maps which was very helpful both in my interview preparation and during the project.

'Inside' Knowledge Tools

I had started looking at past graduation projects from the TU Delft repository to have an idea about what graduation projects look like. What are the approaches, expectations, and deliverables. This is the best source to get a first understanding of expectations. I also looked at reports which used ViP, reports which were done at Exact, and reports shared by my chair to have a better understanding, and more ideas.

'Outside' Knowledge Tools

Apart from books, I subscribed to newsletters from Venture Capital companies and well as Machine Learning experts to stay up to date with the happenings of the industry. I also followed thought leaders on Twitter to see the current pulse both in accounting industry (Twitter accounts of competition players like Xero and Sage) as well as broad technology and design thought leaders (Naval Ravikant for Blockchain, Luke Wroblewski for Design, Fred Wilson for Venture Capital, among others).

Also, Youtube is great source to learn about new technologies. And if you know a bit of Python, 'Intro to Machine Learning' course from Udacity is a great place to start picking up Machine Learning. There were other sources like this, but these give an idea. Basically, like in other cases, triangulate your learning sources too

A4.6 Getting To People

Getting to Customers

This can be very hard in a big company. Your best bet is again to try as many people. I approached UX team members, Marketing Managers and the Customer Service team. The last source was the best. The Customer Service people deal with customer issues daily and have fine-grained data on them. So, I would suggest approaching them first.

Getting to Experts

Here, I used my personal network extensively. The response rate was higher and they were willing to share more.

In all cases, try to reach out to more people, and more variety of people. Try to make conversations with people who have something similar with you. They may be from the same country or region (if you are an expat), they may like the same movies or same food, or have the same sports hobbies. This will enrich your understanding of your own context.

A4.7 Managing Personal Energy

Graduation project is a high-stakes enterprise and it is

critical to manage your own emotions and energy for optimal outcomes. Things are hard especially at the start when objectives are be unclear and relationships are new. I faced a tough spot when no customers were responding but tried to keep positive by maintaining a good diet and going out on long walks with friends. I also kept reading inspirational books to maintain a balanced perspective.

If you can ride out the hard time, it will be enough, you will be fine when the good wave catches you. After 3 weeks of struggle, I had so many customer contacts I had to say no to them. So, keep positive and keep the faith.

Appendix A5

Abbreviations

SN	Abbreviation	Full-Form
1	AI	Artificial Intelligence
2	ARR	Annual Recurring Revenue
3	ASR	Automated Speech Recognition
4	BaaS	Blockchain-as-a-Service
5	CAC	Customer Acquisition Cost
6	DOS	Disk Operating System
7	EOL	Exact Online Software
8	ERP	Enterprise Resource Planning
9	ICT	Information and Communication Technology
10	IoE	Internet of Everything
11	IoT	Internet of Things
12	IT	Information Technology
13	LTV	Lifetime Value
14	ML	Machine Learning
15	MRR	Monthly Recurring Revenue
16	NLG	Natural Language Generation
17	NLP	Natural Language Processing
18	NLU	Natural Language Understanding
19	OS	Operating System
20	P2P	Peer to Peer
21	PE	Private Equity
22	SaaS	Software-as-a-Service
23	SME	Small and Medium Enterprise
24	TTP	Trusted Third Party
25	TTS	Text to Speech
26	VC	Venture Capital
27	ViP	Vision in Design
28	VUI	Voice User Interface
29	HCI	Human Computer Interface

Appendix A6

The SaaS Business Model

The emergence of SaaS (Software-as-a-Service) business model is a reflection of the broad servitization trends in the software industry. This is a clear example of how changes in technology create changes in business models.

In the era of desktop computers and CD-ROM drives, the on-premise business model dominated for software. This simply meant that consumers bought their software (like Microsoft Office) on a CD-ROM and installed it on their computers. The software providers primarily generated revenue on the sale of the disc based software, and subsequently on the servicing of software. The application was on the CD, and then on the user's machine.

However, the widespread rise of cloud technologies has given rise to a new business model. In SaaS, the software is not bought one-time on a CD, but is always present in the cloud. The user can subscribe to the software, just like they subscribe to magazines or newspapers. In most cases, the users pay a monthly or yearly fee for using the software. The service is delivered to them in their browser, mostly through web applications. For example, for Dropbox, users can pay a fixed monthly fee per user. Even heavy desktop applications like Adobe Photoshop are now available through a SaaS pricing model.

The SaaS business model has these advantages for customers:

- The software does not need to be 'upgraded' - it upgrades on the cloud itself.
- Up-front prices are much lower.
- The user can stop the subscription when they are no longer using the service
- Software syncs across devices on the cloud, giving the user a seamless experience
- In case of web-based apps, the software does not take any disk space on their computers, it can be run in the browser.

Since the revenue recurs every month, the sum total of revenues from all customers of a SaaS provider is called Monthly Recurring Revenue or MRR, and is a key indicator of business performance. The same metric taken annually is called Annual Recurring Revenue (ARR).

This business model also makes discussion of a few more metrics important:

- **Customer Acquisition Cost** (**CAC**) - this is the cost to acquire a single customer by the company. This generally reflects in the Sales and Marketing expenses on a company's annual statements. To put it simply, it is the cost a company incurs to acquire customers.
- **Customer Lifetime Value** (**LTV**) - This measures the expected earnings made from a customer over the time the customer uses the product. For example, if a customer uses a SaaS product for 15 months, and pays $10 per month, then her LTV is $150.
- **LTV/CAC ratio -** This metric is used to measure the health of SaaS based businesses. This measures how much revenue can be generated from a customer, versus the costs incurred to acquire him or her. The importance of this metric is underlined by the fact that some SaaS companies like Xero mention this ratio in their annual statements.

This business model has the following implications for the providers:

- **It takes time to recover value from customers.** Since the up-front price is low, the business generates enough revenue from a customer only if the customer keeps subscribing to the application for a sufficiently long period of time. This makes customer retention a crucial metric for the business. For example, if a company pays $3000 to acquire a customer which pays $250 per month, they will take 13 months to break-even on the customer. Thus, the company has to make sure that the customer does not leave their service before this time period to avoid making a loss on that customer.
- **Cash flow looks different with this business model.** The more customers are acquired per month, the more the cash flow becomes negative in the initial months. However, this cash flow rises much faster when the customers start becoming cash flow positive.

"Cloud solutions by definition are by subscription, whereas traditional software is sold under license. Initially we offered annual cloud subscriptions, but to lower entry and exit barriers we introduced monthly subscriptions. With that we introduced the risk of customers canceling after one month. **Dealing with that risk basically meant we had to rely on the quality of our product**: confidence that we retain our customers because our solutions are of value to them, not because they are locked-in."

Erik van der Meijden, CEO, Exact

Appendix A7

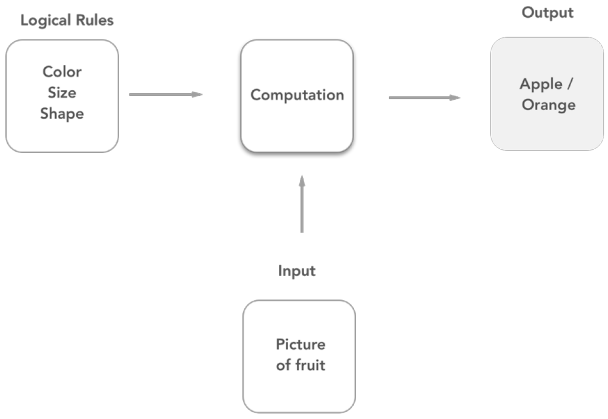
Notes on Technology

In this section, I lay out my understanding of the basic technologies which are investigated in the project. These are - ML, NLP, and Blockchain. This is simply another exercise to improve my understanding by trying to formulate an understanding of technology in my own words. This section is written for the layman and will be helpful to anyone who is beginning to learn about these technologies. But this is not exhaustive by any means, it is just a start.

Machine Learning

Machine learning (ML) is based on algorithms which involve making predictions from data. They can learn from data without rules-based programming. However, it differs from other approaches in a crucial way. Traditionally, we solve problems using computers by giving them an algorithm, then the inputs, and the machine would produce the solution or output. However, with machine learning approaches, this is reversed. We feed the solutions to the machine, and the output is the algorithm. The machine or program, learns by itself, how to solve the problem, by finding out the patterns from the solutions.

For example, in the traditional way of programming, if we have to write a program to distinguish between an image of apples and oranges, we would have to specify the logic of differentiation to the machine. We would program instructions on the size and shape, colour, and other characteristics of the fruits so that the program could identify them. If the shape is round, it is more likely to be an orange and so forth.



Traditional way of programming with logical rules

Thus, a set of logical rules would be able to tell us if a new image is of an apple or an orange. While seemingly straightforward, there are some problems with this approach:

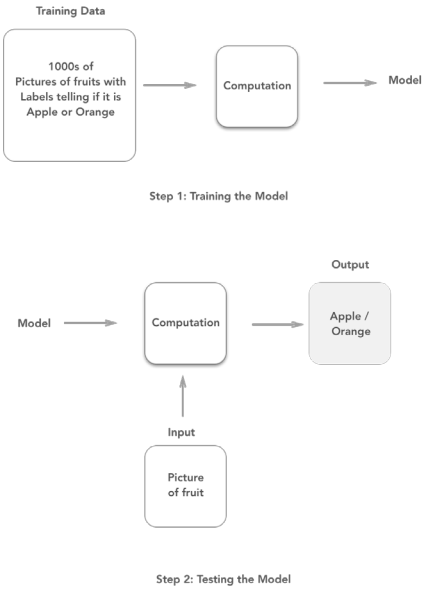
- **It is hard to describe things precisely:** Even in this simple example, it would make things complex to figure out exactly what makes an apple different from an orange. Some apples could be more round, some of them could be more light colored (depending on their ripeness or species). This is compounded by the fact that humans themselves are not good at articulating exactly how they can identify or recognize something.
- **It would vary significantly with the programmer:** This lack of precision would also make it subjective. Different people will probably come up with different logical rules for differentiating apples and oranges.
- **It is not generalizable:** While it may be possible to come up with rules to differentiate apples and oranges, we will need an entirely new set of rules to differentiate between say grapes and oranges.

Now, in machine learning, instead of a human specifying how to solve a problem, we provided the machine with answers to similar problems and then, the machine learns itself how to solve the problem for an unknown variable. This approach mirrors the trial-and-error approach of learning which comes naturally to human beings. So, for our apples and oranges example, the process would be carried out in 2 stages as shown in the figure below.

In the first step, we feed the machine thousands of photos of apples and oranges, each labeled, telling that it is an apple or an orange. This data is called training data, as it is used to train the machine to recognize apples from oranges. Once the machine is trained, we can now give it a new image of an apple (or orange), and based from its own learning from the training data, the machine can now recognize the new image.

This approach has the following advantages:

- **No Need for precision:** It is no longer important to describe things precisely, in fact, it is no longer necessary to describe them at all. We only need to provide the labeled data.
- **No subjectivity:** There is no human subjectivity



Training and Testing using ML

(apart from, maybe in the selection of training data).

- **Wide application:** Similar machine learning algorithms can be applied to a vast variety of problems.

The key disadvantage of this approach is the computational cost of analyzing large amounts of data and 'learning' from it. However, with exponentially growing data and faster computing power, these approaches are gaining in popularity and hence are at the top of the Gartner hype cycle.

This model of machine learning is also called 'supervised' learning, because here we provided labeled training data. That is, along with each pictures of apples and oranges, we told the machine what it was. However, in unsupervised learning, even this can be skipped. We only need to provide the training data, and the machine can learn from it. These algorithms have enormous predictive power and can be used in multiple fields from self-driving cars to tagging friends on Facebook.

One central feature of machine learning algorithms is their reliance on data. As a rule of thumb, the more the data there is, the more the accuracy of the learning algorithm.

Given the ability to predict a wide range of future scenarios based on current data and patterns, Machine Learning has tremendous implications for software products in general and Exact Software in particular.

Natural Language Processing

In simple forms, Natural Language Processing or NLP refers to a broad range of techniques to understand human language by machines. It can be seen in the simplified diagram of NLP.

This can be understood using the example of Siri. Once the user says something to a Siri, the words need to translated from voice to text. This part is known as Automated Speech Recognition (ASR). Many algorithms today are very advanced in ASR and are growing in accuracy rapidly.

Once the speech is converted into text, we need to understand the meaning of the text. This part is called Natural Language Understanding (NLU). This is much harder because meaning depends on context and all context data is not easily available to the algorithms. However, these are also getting better and perform well with simple commands. The output from the NLU is used by the Dialog Manager which takes care of the application logic. This is where the processing is done on the data provided according to rules of the application.

The result from this process goes to Natural Language Generation (NLG), where the non-linguistic meaning is translated into human understandable natural language. And this language is further 'spoken out' using Text-to-Speech, or TTS.

It is important to note that in text based interfaces, there is no need for ASR or TTS which makes these interfaces computationally easier, but from a user's point of view, these interfaces require more effort due to typing. On the other hand, Voice User Interfaces (VUIs) are more easy for the user but require more computing power and intelligence. This has implications for the product design.

The Blockchain

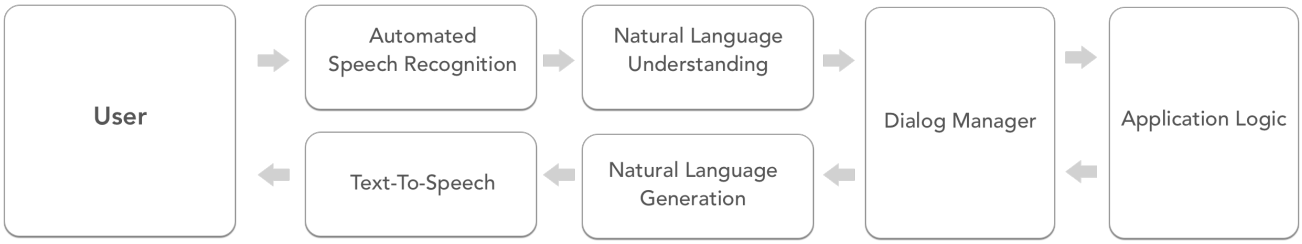
Blockchain is the infrastructure which enables cryptocurrencies like Bitcoin and Ethereum. It is one of the most complex technologies with a wide-ranging impact, over a longer time horizon. However, since Exact Software is an accounting software firm, any innovation in blockchain has clear implications for Exact. Hence to get a deeper understanding of future technology context, is useful to outline the basic applications of Blockchain.

In every system of currency and human exchange, there is a concept of Trusted Third Party (TTP). Basically, we believe in the money we use as cash because the government guarantees its validity. Money backed by the government is also called 'fiat' money. Similarly, every electronic money transaction made is made through an intermediary. In most cases this is a bank or major financial institution.

There are two issues with fiat money. One, it requires backing

Input Data	Output or Response	Application
Picture	Are there human faces? (yes or no)	Photo tagging
English Sentence	French Sentence	Language Translation
Audio Clip	Transcript of audio clip	Speech recognition
Sensors from Hard Disks, Planes, etc.	Is it about to fail	Preventive Maintenance
Car Camera and other sensors	Position of other cars	Self-driving cars
Ads with user information	Will user click on ad? (yes or no)	Targeted online ads

Some applications of ML



Simplified diagram of NLP

of the government. This gives governments a strong control on the money supply in the economy. For example, in 2016, the government of India demonetised currency notes of INR 500 and INR 1000, essentially making more than 80% of the circulating cash worthless. In case of cryptocurrencies like Bitcoin, there is no such possibility due to absence of central control.

Another issue with fiat money is with anonymity of transactions. All transactions made via banks are through a person's identity. However, with cryptocurrencies, someone can transfer money to someone else without revealing their identity, just like in a cash transaction where we don't need to reveal our identity when buying, say, groceries.

Blockchain thus provides a secure and decentralized infrastructure for transferring money over the internet. Secure means that the blockchain cannot be hacked and that data remains anonymous. Through cryptographic algorithms, the blockchain ensures that the data is safe.

Consider the following example as demonstrating the power of blockchain technology. At the moment, Facebook makes most of its revenue by showing ads to its users. It takes the data of users and sells it to advertisers. Users have no control or authority over their data, while Facebook wields enormous influence through access to this data and using its algorithms to manipulate user behavior (getting them to give more data). In a blockchain enabled world, no central authority would own a user's data. Users would own their own data and they could choose see ads in return for money. They could also consume content and pay for it directly to the content creator. Similarly other platforms like Uber and AirBnB could also be disrupted through direct, secure peer-to-peer cash transfers.

Blockchain is relevant for Exact because it can impact the field of accounting. Today, independent auditors are needed to verify a company's accounts, and this exercise is very costly. With the blockchain serving as a trusted, secure ledger, these tasks could be automated using the blockchain.

Apart from this, currently, data is a big source of competitive advantage for most big companies. They can offer better solutions because they own the customer data, and hence the customer relationship. But once blockchain technology lets people own their data in a secure manner, there could be startups which build applications on top of this data. These companies would be potential competitors for Exact. Thus, to maintain its long-term competitive advantage, Exact needs to capture more user data, as well as make the best use of data it currently holds.

Appendix A8

Key Books Referred

To develop a solid understanding of the key trends and cutting edge research in technology, business and human factors, I chose three specific books. One focusing on very long term technology trends, one focusing on near term trends in how businesses are being changed by technology, and one based on research on cognitive psychology. While research papers address depth of technology, books work as efficient summary of the latest research, while informing the wide breadth of factors. This also increases the chances of getting to factors which may not be 'obviously' related to the domain, and this contributes to originality of a solution of a design task (Snoek, Christians and Hekkert, 1999). Moreover, books served as means of data triangulation for technology trends - in concert with knowledge gained from experts. As stressed by (Lincoln & Guba, 1985, p. 283), no piece of information should be given serious consideration unless it can be triangulated.

A brief discussion of the books follows:

The Inevitable: Understanding the 12 Technological Forces which will Shape our Future by Kevin Kelley (2016)

This book is written by the founder of Wired magazine - started in 1993, and remained its executive editor till 2000. This magazine is focused on how emerging technology influences culture, economy and politics. This gives him a very long-term view and understanding of technology trends and how do they shape our world. He has written seven other books on technology and economy.

The central thesis of this book is that technology has a bias which tilts it in certain directions and not others. This bias forces the society and economy to move in certain directions. While cultural factors may accelerate or retard the advance of a specific technology, ultimately, the economics enabled by technology dominates. In that sense, it is 'inevitable'. For example, today's technologies make it easier to track data from various human activities, hence, everything that can be tracked, will be tracked. He offers similar insights on other biases and incentives created by technology, resulting in 12 technological 'forces'.

These 'forces' and their elaboration provided a rich set of context factors from diverse areas of the technological world. However, some sections were too 'futuristic' or less relevant to the domain, and hence they were ignored.

Machine, Platform, Crowd: Harnessing our Digital Future by Andrew McAfee and Erik Brynjolfsson (2017)

This book is written by two MIT professors who are well known in the field of economics and technology. Prof. Brynjolfsson is the director, and Prof McAfee is the co-director of MIT Initiative on the Digital Economy. They have earlier authored similar books on the changes in technology and how it impacts the economy.

This book looks at three broad trends in today's business world with a lens of underlying economic principles. These trends are termed Machine, Platform and Crowd. In the first part of the book, the authors talk about how machine learning is making new forms of innovation possible, and how today's machines are even getting good at creativity and judgement - the things which humans are supposed to excel at.

In the second part of the book, they explain platform business models in detail. Most of today's largest businesses are powered by the platform model. They elaborate how the economics of platforms make them a dominant factor in today's economy. They also list out characteristics of businesses which are defensible against competition from platforms.

In the last section of the book, they talk about the power of the 'crowd' in creating innovative products. They differentiate between the 'core' of the company - which consists of its employees and management, and the 'crowd' which is the set of outside players which can contribute to innovation. It also talks about decentralization made possible with technologies like blockchain as well as the limits to these initiatives.

This book helped in gaining context factors not just from a technological, but also from an economics and business model perspective.

Thinking, Fast and Slow by Daniel Kahneman (2011)

Daniel Kahneman is a Nobel Prize winning psychologist known for his work in judgement and decision theory. This book covers his research on cognitive biases done over three decades as well as work on prospect theory and happiness. This was chosen to be the key source for understanding context factors governing human decision making. Since these were fundamentally linked to humans, these were noted as principles in the ViP framework.

Kahneman (2011), talks about two systems of thinking, System 1 and System 2. System 1 is what we call intuitive thinking, where, for example, we know that a person is angry just by looking at their face. On the other hand, System 2 is the more deliberate form of thinking, for example, when we calculate the product of 17 and 24. Many of our psychological biases can be explained in terms of these 2 systems of thinking.

The book provided key insights around how we deal with information to make judgements. Most of the times, we make snap judgements based on too little data, this is governed by System 1, which wants to reach a coherent conclusion fast and seeks evidence to prove existing beliefs. Similarly, humans being tend to 'anchor' on the first number they see in any context. Multiple factors of System 1 thinking contribute to errors we make regularly.

Similarly, the book also provided some strategies to handle some of these errors. For example, looking at base rates of events helped in judging their probabilities better than looking at representativeness. This book also mentioned some key points about the psychology of entrepreneurs which is especially relevant for Exact.

In all, these books were meant to be starting points for the exploration and not the final word. They helped in updating my understanding when questioning technology experts, gave me a solid base to start looking for patterns, and served as a rich source of new ideas about business models, products and the human mind. As mentioned earlier, other books and research papers were also used to build the broad context factors.

Appendix A9

Contacting Customers

A9.1 E-mail to Customers of Exact

Beste klant,

Bij Exact werken we aan nieuwe producten om de relatie tussen ondernemers en hun accountant te verbeteren.

Om betere producten te kunnen maken, hebben wij meer inzichten nodig en hiervoor benaderen wij u.
Wij zijn vooral benieuwd naar de manier waarop u als ondernemer samenwerkt met uw accountant.

In de komende 3 weken zal ik hiervoor interviews houden met gebruikers van Exact Online. Deze interviews zullen in het Engels zijn en duren ongeveer 60 minuten. Voorbereiden van uw kant is niet nodig en ik zal zelf bij u langskomen op locatie.

Heeft u interesse om mee te doen?
Laat het mij dan alstublieft weten via een reply op deze email. Het zou handig zijn als u meteen uw voorkeur aangeeft voor een tijd en datum.

Alvast bedankt voor uw medewerking.

Met vriendelijke groet,

Gaurav Mathur
0647611938

A9.2 Calling Scripts for Exact Customers

Script 2 worked much better than Script 1 in eliciting favorable responses.

Script 1

I am calling from exact and we are doing a research on how the entrepreneur - accountant relationship will change in the next 10 years. Since you are a valued customer of Exact, I was wondering if you have time in the coming 2 weeks for meeting me?

The interview will take around 45 minutes, and will be around understanding your business and your relation with your accountant.

Script 2

Goeie middag,

I am Jim, calling from Exact, and I got your number from the customer success team here. We are working on an innovation project, and I was wondering if I can pay you a visit to understand your needs better.

Anytime in next 2 weeks is fine.

A9.3 E-mails to Entrepreneurs at Yes! Delft

Hi [Name],

Congratulations for being part of the Yes! Delft program.

I am a Gaurav, a graduate student of Strategic Product Design from TU Delft, doing my graduation project with Exact Software, Netherlands. I am researching the entrepreneur-accountant relationship.

Would be great if I could pay you a visit in the coming couple of weeks. Could you let me know when you will be available?

Thanks !

Kind Regards,

Gaurav
+31 647 611 938

A 9.4 Mail for Academic Experts

Dear Prof. [Name],

I am Gaurav Mathur - a final year Graduation student of Strategic Product Design program at TU Delft. I am working on my graduation project with Exact Software, Netherlands. The project involves studying the impact of new technologies (like AI and Blockchain) on business and accounting. I try to answer: How could these affect how business is done - 10 years from now? What do these developments predict for society in general and businesses in particular? What is not likely to happen?

I believe rapid developments in technology are creating new challenges and opportunities, but most of us are not prepared. But if we can filter out the important factors from the noise, maybe we can leverage these for a clearly better future.

After going through your research which is focused on technology and its impact on business and society, I was wondering if you find this interesting.

My friend [Name] suggested your insights on these topics would be valuable. Could you take out time for a 30-40 min interview in the coming 3 weeks?

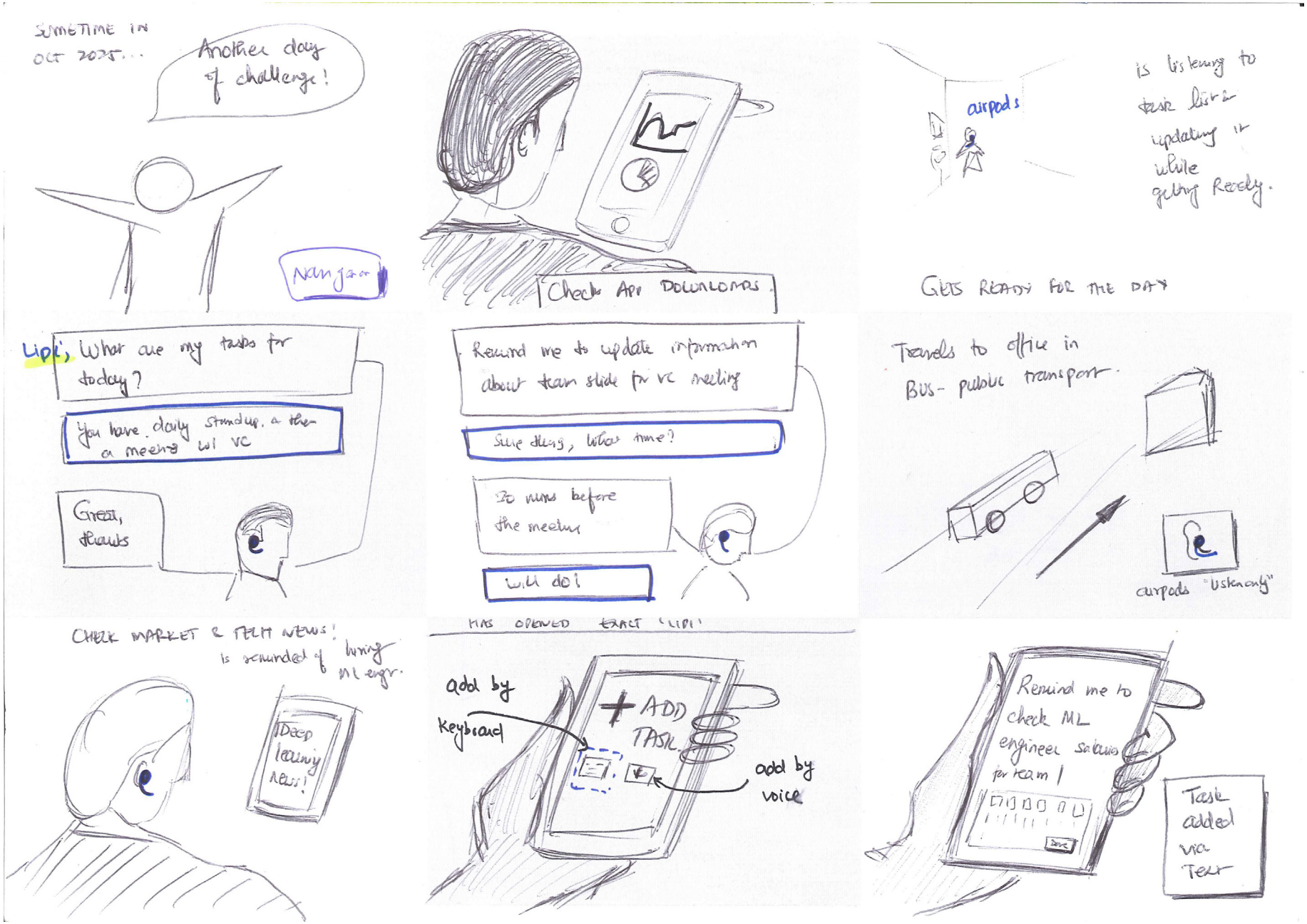
Please let me know when are you available.

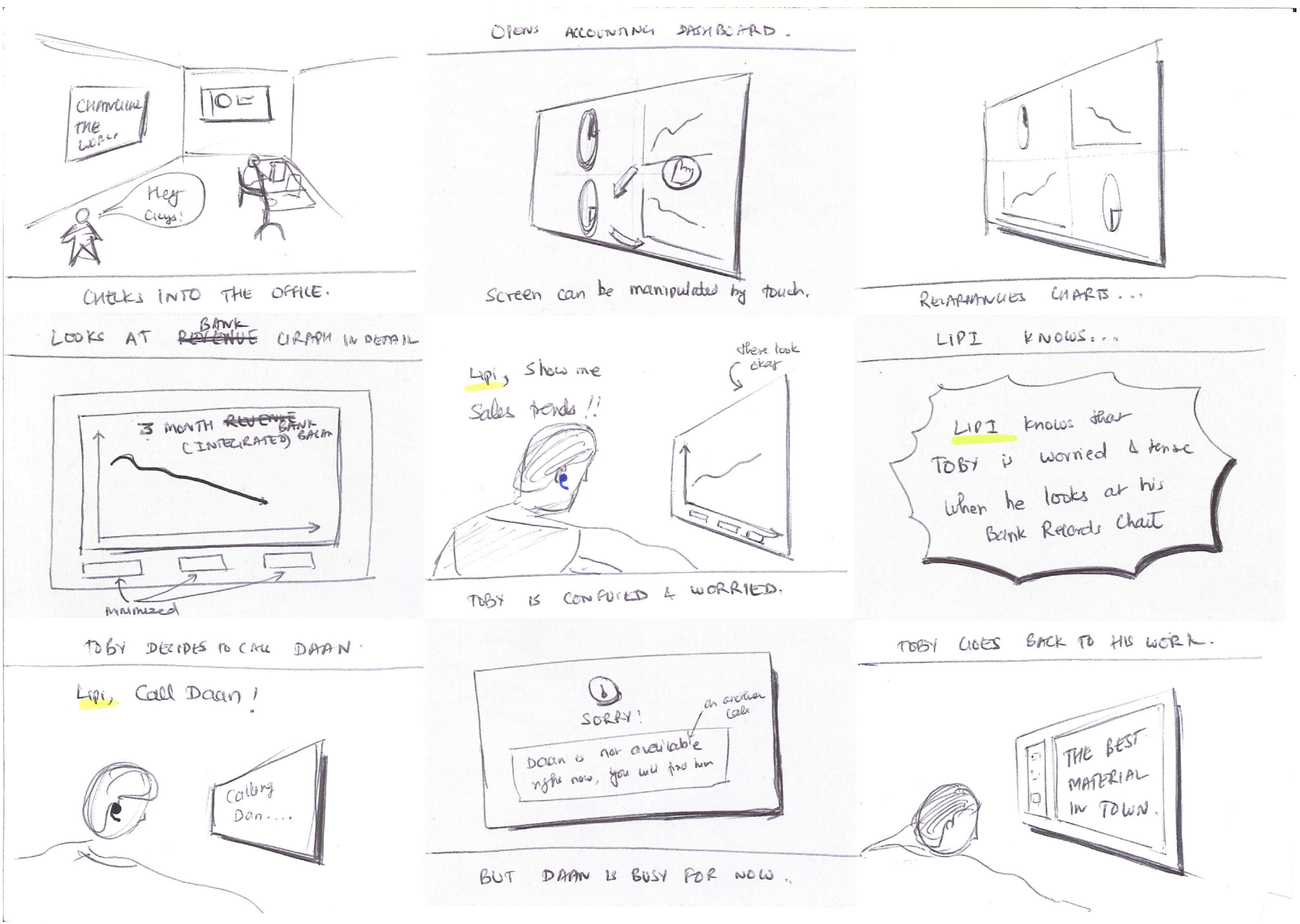
Thank you,

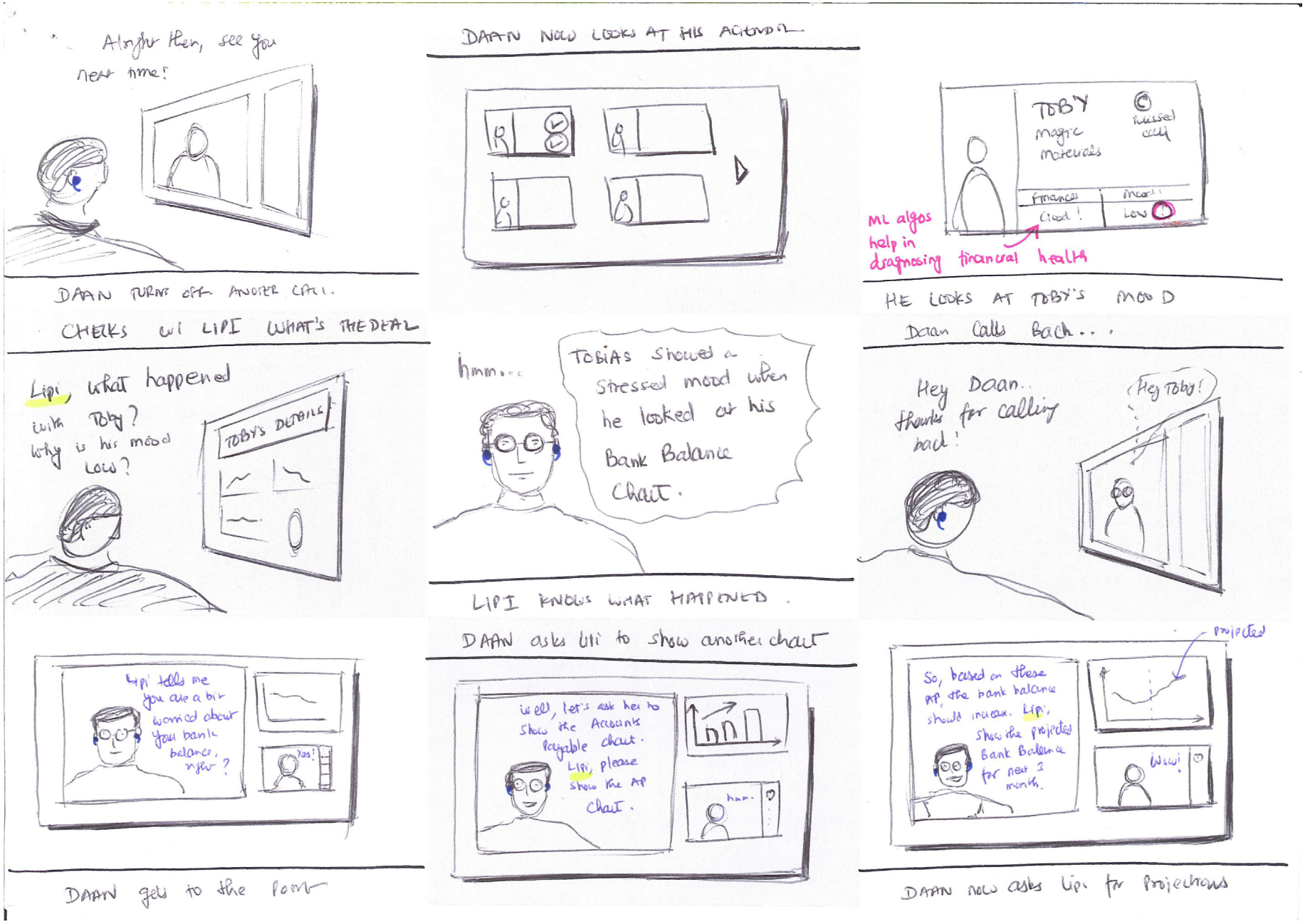
Gaurav Mathur
0647611938

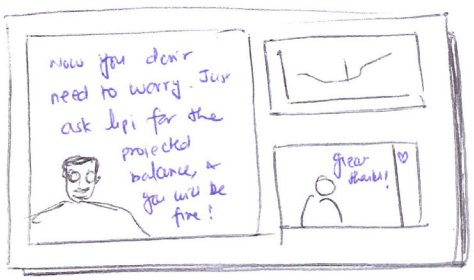
Appendix A10

Ideation Sketches for Scenario Development


SOMETIME IN OCT 2025...
Another day of challenge!
Alarm goes
Check App Downloads
airpods
is listening to task list & updating it while getting Ready.
Gets Ready for the day
Hey Siri, What are my tasks for today?
You have daily standup, & then a meeting w/ VC
Great, thanks
Remind me to update information about team slide for VC meeting
Sure thing, what time?
30 mins before the meeting
Will do!
Travels to office in Bus - public transport.
airpods "listening"
CHECK MARKET & TECH NEWS!
is reminded of hiring ML engr.
Deep learning news!
HAS OPENED EXACT 'SIRI'
add by keyboard
+ ADD TASK
add by voice
Remind me to check ML engineer salaries for team!
Task added via Text

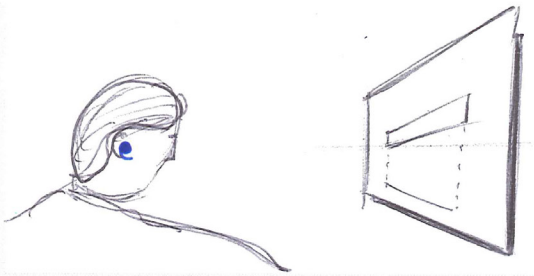

CHANGING THE WORLD
Hey Guys!
CHECKS INTO THE OFFICE.
OPENS ACCOUNTING DASHBOARD.
Screen can be manipulated by touch.
RECAPITULATES CHARTS...
LOOKS AT BANK REVENUE GRAPH IN DETAIL
3 MONTH BANK (INTEGRATED) GRAPH
MINIMIZED
Lipi, Show me Sales trends!!
these look okay
TOBY IS CONFUSED & WORRIED.
LIPI KNOWS...
LIPI knows that TOBY is worried & tense when he looks at his Bank Records Chart
TOBY DECIDES TO CALL DAAN.
TOBY GOES BACK TO HIS WORK.
Lipi, Call Daan!
Calling Dan....
SORRY!
on another call
Daan is not available right now, you will find him
BUT DAAN IS BUSY FOR NOW.
THE BEST MATERIAL IN TOWN.


Alright then, see you next time!
DAAN TURNS OFF ANOTHER CALL.
CHECKS w/ LIPI WHAT'S THE DEAL
Lipi, what happened with Toby? Why is his mood low?
TOBY'S DETAILS
Lipi tells me you are a bit worried about your bank balance, right?
Yes!
DAAN gets to the room
DAAN NOW LOOKS AT HIS ACCOUNTS
TOBY
Magic Materials
Missed call
Finances
Mood
Good!
Low
ML algos help in diagnosing financial health
HE LOOKS AT TOBY'S MOOD
Daan Calls Back...
Hey Daan.. thanks for calling back!
Hey Toby!
hmm...
TOBIAS showed a stressed mood when he looked at his Bank Balance Chart.
LIPI KNOWS WHAT HAPPENED.
DAAN asks Lili to show another chart
well, let's ask her to show the Accounts Payable chart. Lipi, please show the AP Chart.
hmm..
So, based on these AP, the bank balance should increase. Lipi, show the projected Bank Balance for next 3 months.
Projected
Wow!
DAAN now asks Lipi for Projections



DAAN assures TOBY further.

AND says Goodbye!



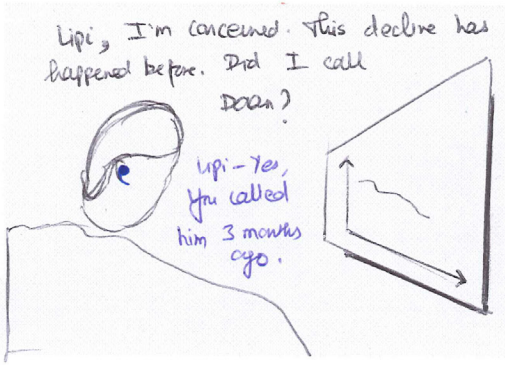
TOBY Goes back to work, sees task list

THINGS ON NORMALLY...

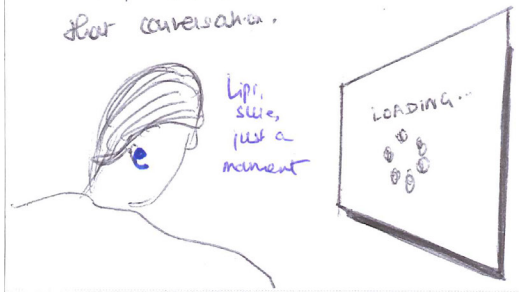
FOR A FEW MONTHS..

THEN TOBY FINDS ~~AT~~ THIS AGAIN.

BUT TOBY KNOWS THIS HAS HAPPENED BEFORE



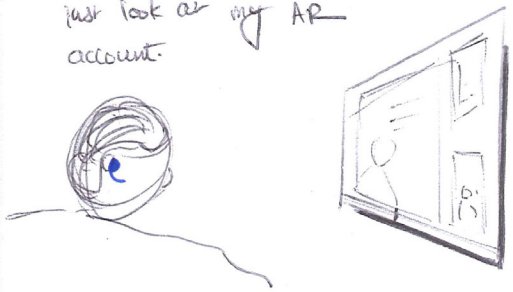
Great, Lipi, please show me that conversation.



SO HE NOW PULLS UP THAT INFORMATION

AND HE CAN SEE THE CONVERSATION AGAIN AS A VIDEO.

Of course, things are fine, let me just look at my AR account.



AND HE REMEMBERS THE STORY

DAAN GOES FOR HIS DAILY JOG..

Welcome Daan!

WARN (2) SUPPORT (1)

CLARIFY (3) CONGRAN (5)

GETS READY & LOGS INTO CENTAUR

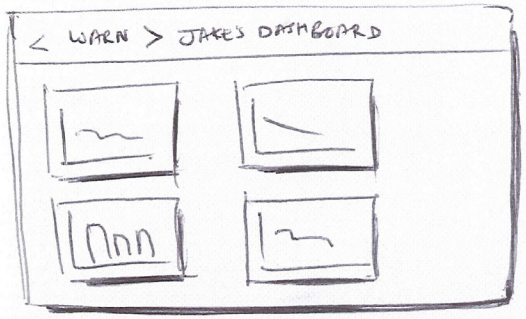
CLICKS ON PEOPLE TO WARN..

< WARN

(2) JAKE

(3) LEO

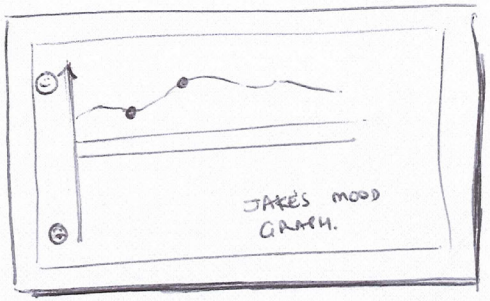
< WARN > JAKE'S DASHBOARD



DAAN HAS A LOOK AT JAKE'S KEY NO:

Checks WITH LIPI ABOUT Jake's emotion

Lipi, Jake's no's are down, can you show me Jake's emotions?



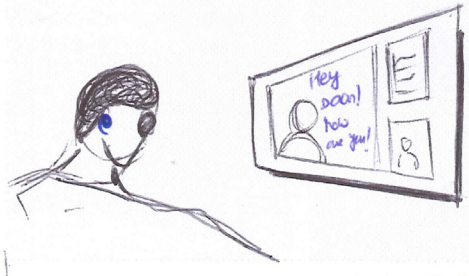
JAKE'S MOOD GRAPH.

Lipi shows DAAN a chart of Jake's mood over time.

DAAN THINKS ABOUT THE SITUATION..

Hmm, I can see Jake is a very cheerful person, but he is not taking good care of his finances; in fact, he checked the key figures a few weeks ago. I need to call him.

Lipi, call Jake..



DAAN CALLS JAKE ... & IS CONNECTED.

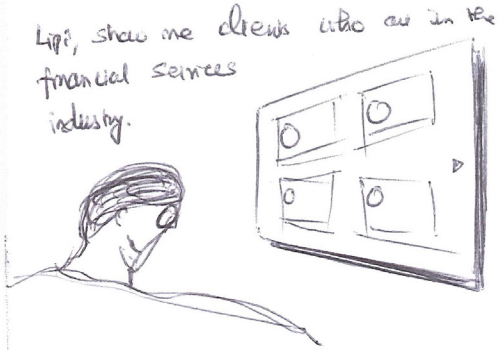
DAAN WARNS JAKE.

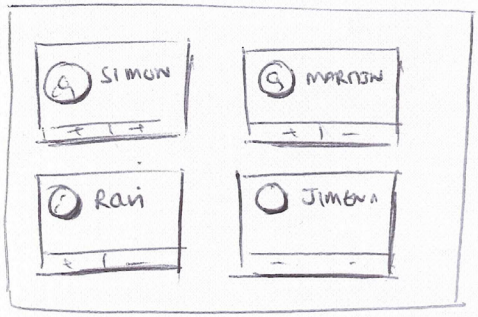
Jake, I know you are a +ve guy but you need to do something about pending invoices.

JAKE CHECKS IT...

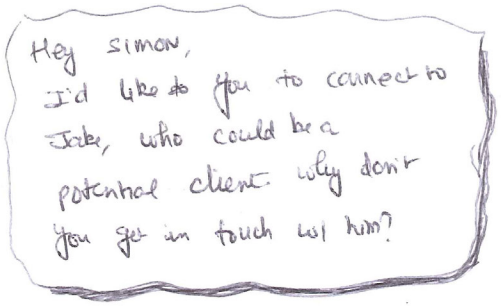
BUT THIS IS NOT ENOUGH..

DAAN IS ON THE CASE NOW





DAAN CALLS SIMON....



SIMON LOOKS PROMISING.

Appendix A11

Frequently Asked Questions (FAQ) for Centaur

Frequently Asked Questions - Entrepreneur

How exactly, does it make the entrepreneur perform better?

Centaur provides a daily financial performance score to entrepreneurs. The Centaur algorithm takes your overall financial information into account and compares it with entrepreneurs who are most similar to you. In the 'urgent' tasks, you see a list of tasks which will help improve your financial score. This score also helps the accountants to prioritize which entrepreneurs need most help from them.

What is special about Centaur Video Calling?

Using Centaur, you can now see your financial data on the screen while talking to the accountant, who sees the same data on his side. This makes sure you look at the same figures and are literally on the same page. The voice assistant 'Lipi' is also active during the call and you can ask it to produce dynamic charts during the call. Finally, a graph of your emotions is visible to the accountant on his screen.

What if I am not using Exact Online?

Using Exact Online (EOL) is needed to use Centaur as it integrates with EOL at the back-end.

Do both me and my accountant need to install it?

Yes, both sides need to install it.

What if the accountant is not available when I call?

In that case, she will see a 'missed call' just like normal calling tools. She can call you back when needed.

What are smart insights? How do they work?

Smart insights are recommended actions tailored specifically for you. They mostly appear as 'Urgent' tasks in your task list. Doing them will clearly improve your financial performance. They also show up as simple sentences under your financial numbers to explain what is happening, and why is it happening.

How does Centaur understand my emotions?

Centaur primarily uses your facial expressions to understand what you are feeling. It also uses your tone of voice as well as the actual words you use.

I am not comfortable with video, can I just make audio calls?

Yes, you can make audio calls, as well as text the accountant. But for best communication experience, we recommend video calling. Emotion capture from face will work better with video.

What are 'summaries'?

Every conversation is stored both as a complete transcript and as a summary. Summaries do not have your personal information, and can be used by Centaur to help others. For example, a conversation you have can be used by other entrepreneurs if they have the same problem. Similarly, you too benefit from the summaries generated when other entrepreneurs talk to other accountants. This makes the system exponentially more intelligent with more conversations.

I am a freelancer and I do not have an accountant, is Centaur still useful for me?

Yes, you can still benefit from the insights generated by the system. And then, when you grow your business to more people and need an accountant, you will avoid the hassle involved in migrating to another accounting software.

Is it available on mobile, and desktop?

Yes, Centaur is designed for all kinds of screens, and optimized for multi-touch interfaces. Though all tasks can be done with touching and talking, you can still type, if that's how you need to get a task done.

What is 'Lipi'?

Lipi stands for Language Interpretation and Processing Interface (LIPI). It is your smart virtual assistant which becomes smarter with each conversation you have with your accountant. Lipi can handle highly complex queries as well as give you summaries of other people's and your own conversations, just by your voice. You can invoke Lipi by using the 'Hey Lipi' command.

How can I use Lipi if I am in a crowded

place and do not want to use voice?

In this case, you can use Lipi as a chatbot, just type out what you need to know.

How is it better than email and whatsapp?

E-mail and whatsapp are general purpose communication tools. E-mail is not designed for real-time collaboration. Whatsapp is designed for informal chat and not deep, strategic conversations. They do not capture emotional cues and it is hard to search within conversations which have already taken place.

How is it better than Skype? Or other video calling tools like Google Hangouts?

None of the current video calling tools allow either video summaries or emotion tracking. Once you end a conversation on Skype, it is lost forever. You can't search it again, and no one else can use it either. Finally, these tools do not have access to your financial information.

How about tools like Slack? They now have screen sharing which helps in collaboration, how is this better?

Tools like Slack are indeed useful for collaborative teams but do not provide a seamless experience because they are not designed for face to face conversation. They rely more on texting and file sharing. Centaur makes it possible to access financial information during conversations, in the same window, making the experience much more clean and seamless. Video calling in Centaur also enables capturing real-time emotions, which tools like Slack cannot provide.

What about actual, personal meetings, aren't they better?

While it is great to meet in person, even these conversations can be lost once they are over. Many times you have to capture notes in writing or send across mails of what you have discussed. Conversations in Centaur remove these hassles. However, if you want to spend more informal time or a cup of coffee, real-life meetings are still the best for that.

Centaur is not designed to completely replace in-person meetings, but to make more conversations possible from a distance, and enhance conversation quality.

What if more than one person wants to be a part of the conversation?

Current version of Centaur is designed only for one-to-one communication. We might introduce a multi-person tool, based on customer demand.

What about privacy of my personal data?

All your data is private and stored securely. For details please look at our privacy policy.

Which widgets can I add to Centaur?

You can add any task management widget of your choice from Trello to Jira. We are working on adding other kinds of widgets.

Can the accountant see all of my data?

Yes, the accountant can see all of your financial and EOL data, but not the widgets which you install.

Does Centaur provide me news or information from the outside world? Like some news sources or blogs?

Centaur focuses only on the financial and emotional information. It is designed keeping in mind that other specific tools are better suited for gathering outside information. Of course the Centaur interface makes it easier and intuitive for such information and insights to be communicated between entrepreneurs and accountants. The only other source of information right now is the task management widget.

Frequently Asked Questions - Accountant

What does client score mean?

It is calculated based on the overall performance of all your clients, and compared with other accountants who have a similar score. To improve this score, you can focus on the entrepreneurs who are not performing well and figure out ways to improve their performance.

Why are summaries useful for the accountant?

Accountant can look at summaries as well as relate them to how the client performed. This will help them see which advice worked the best for the client, and improve them over time. Thus, the accountant herself becomes more effective.

Since 'Lipi' learns from the accountants' conversations, would that not put accountants out of business?

This might seem to be the case, but is not. Since laws and regulations change rapidly, it is very hard for any technology to capture the complexities of the real world. Instead, Lipi will help accountants to focus on truly valuable and innovative advice. Also, accountants provide a human touch to the entrepreneurs in times of distress.

Can I switch off the emotion indicator while talking?

Yes, you can minimize it.

Appendix A12

Quantitative Evaluation

Survey Format

Exact Centaur Feedback

Hi ! Thank you for being a part of my graduation project at Exact. Please let me know what you think of the product concept. (I have shared the YouTube Link)

The form is short, and the product video is a bit over 15 minutes. Overall, this will take around 20 minutes of your time. I will keep your responses private and use them for research only. Thanks again !

- Gaurav

P.S. Please find the product video on this link - https://www.youtube.com/watch?v=2vxAGtKAF_U (full-screen view will give greater clarity)

Are you an entrepreneur or an accountant? (You can choose these also if you are a former entrepreneur/accountant)

- Entrepreneur
- Accountant
- Design Expert
- Other (Please Specify)

What is your first reaction to the product?

- 1- Very Negative
- 2 - Somewhat Negative
- 3 - Neutral
- 4 - Somewhat Positive
- 5 - Very Positive

How would you rate the quality of the product?

- 1- Very Negative
- 2 - Somewhat Negative
- 3 - Neutral
- 4 - Somewhat Positive
- 5 - Very Positive

How innovative is the product?

- 1- Very Negative
- 2 - Somewhat Negative
- 3 - Neutral
- 4 - Somewhat Positive
- 5 - Very Positive

When you think about the product, do you think of it as something you need or don't need?

- 1- Very Negative
- 2 - Somewhat Negative
- 3 - Neutral
- 4 - Somewhat Positive
- 5 - Very Positive

If the product were available today, how likely would you be to buy the product? (assume pricing matches industry standard)

- 1- Very Negative
- 2 - Somewhat Negative
- 3 - Neutral
- 4 - Somewhat Positive
- 5 - Very Positive

How likely is it that you would recommend this product to a friend or colleague? (0 - Not at all likely, 10 - Extremely likely)

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

What are the things you like the most about this product?

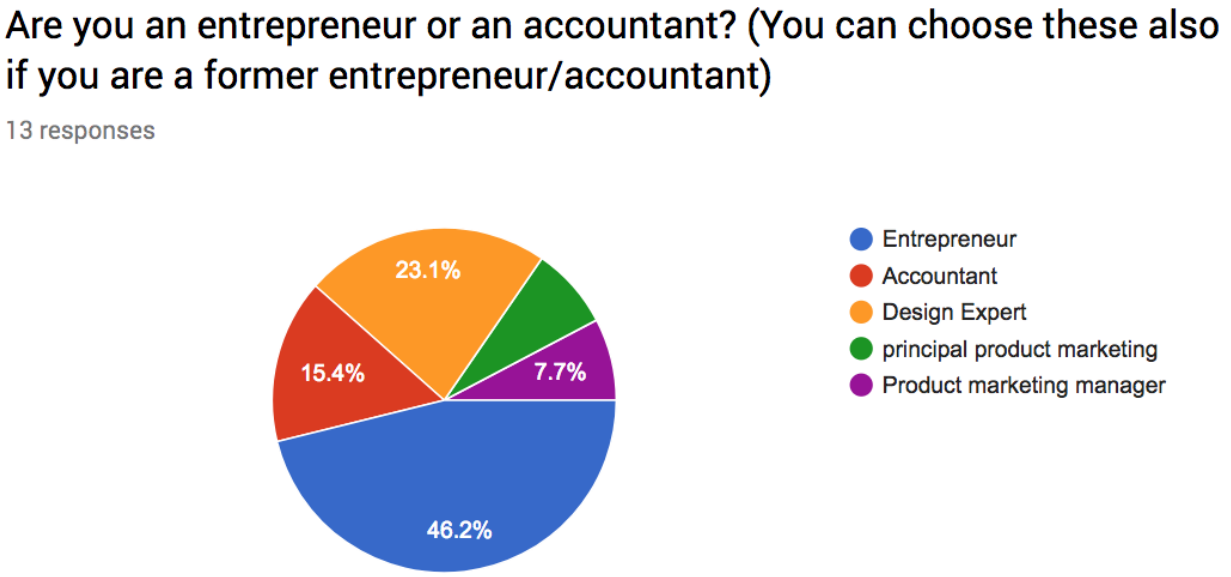
Long-answer Text

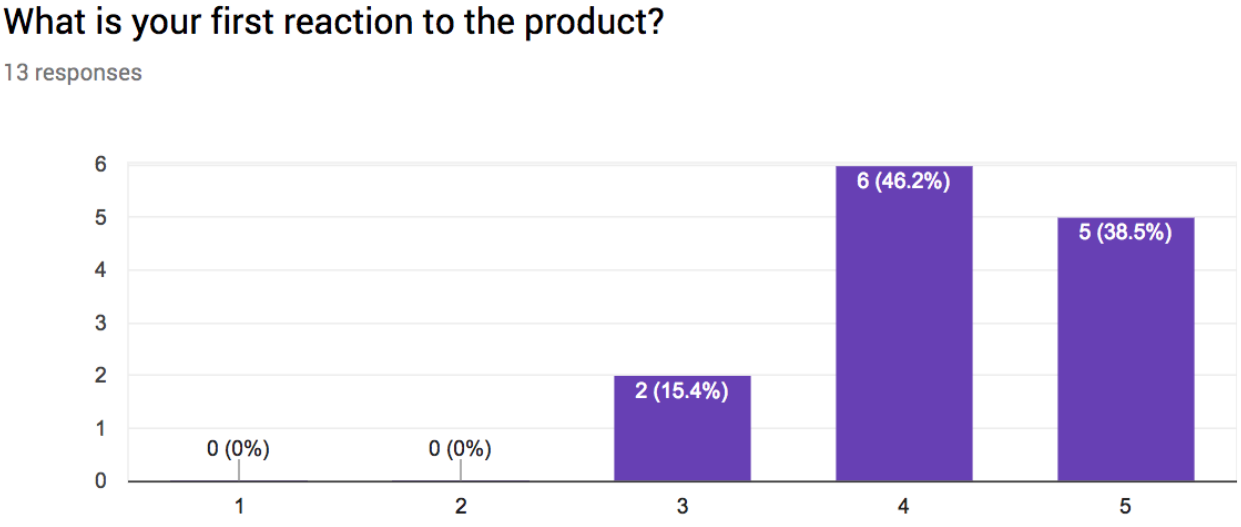
What are the things you would like to add to or improve in this product?

Long-answer Text

Survey Results

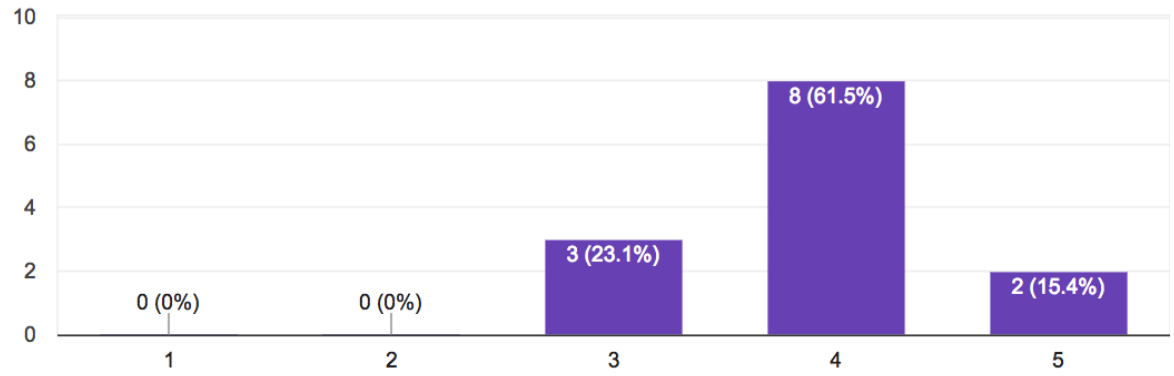
The survey gathered 13 responses at the writing of this report.
The overall results are shared below.





How would you rate the quality of the product?

13 responses



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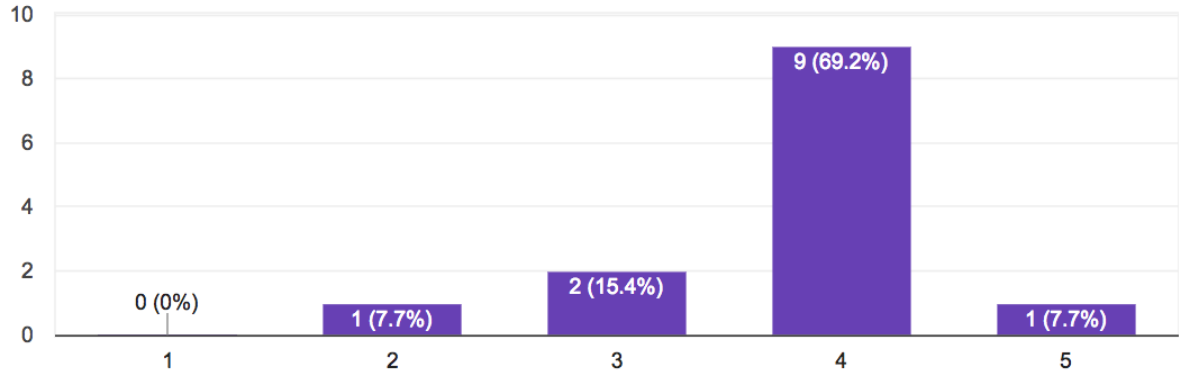
13 responses



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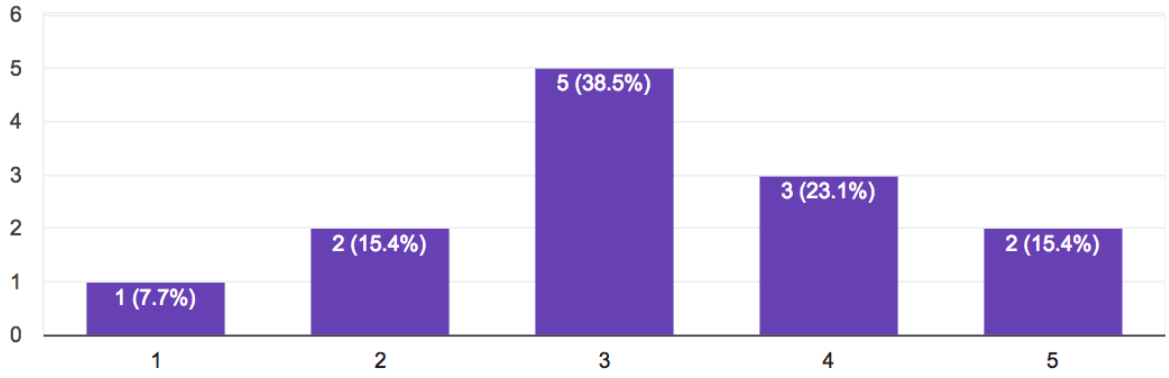
13 responses



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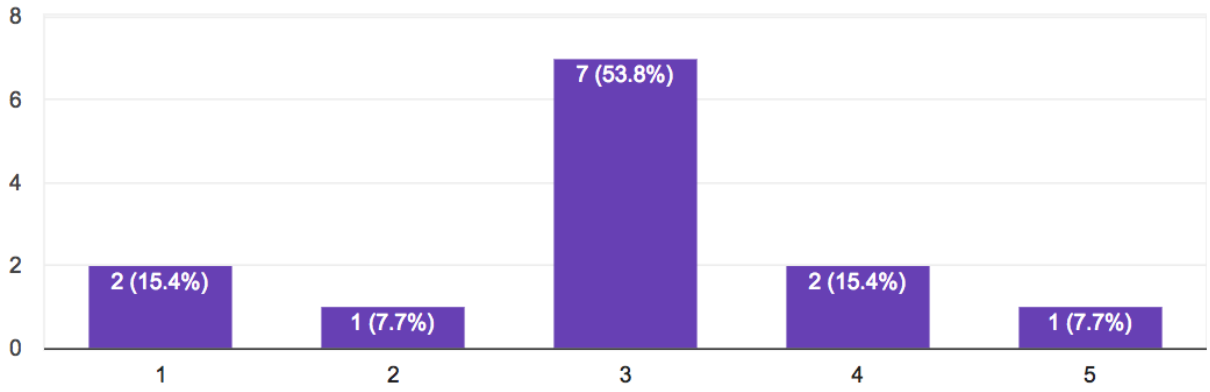
13 responses



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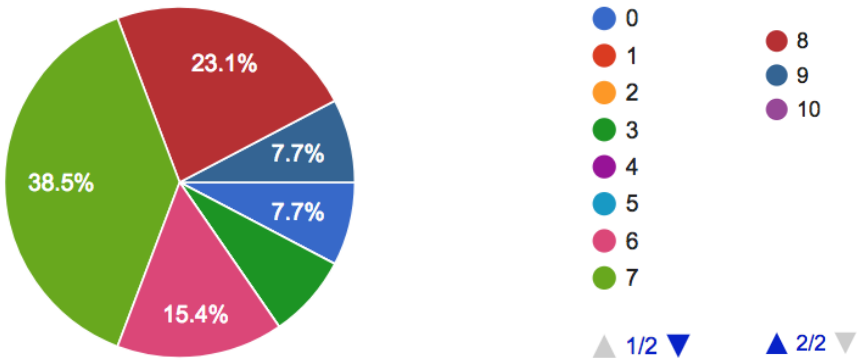

What are the things you like the most about this product?

- It will simplify the complex world of accounts. A quick update on financial status to make decisions. Keep a connect with the accountant.
- I like the initial overview console.
- I can see that the idea of "financial health score" may provide entrepreneurs, as well as accountants, a quick impression of where they stand, inviting immediate action when needed. The face-reading emotion indicator is, from the first impression, an interesting twist that may help the accountant understand his clients and himself better, assuming that it works flawlessly. The comparison with industry average metric is also interesting to see.
- Real time sentiment analysis. Clean design.
- I really like the concept that it provides me clear and understandable insights about my financials. currently I have to use different tools and a lot of specific knowledge to figure out the things that Centaur just puts in an easy to navigate application.
- The improved communication between the accountant and the entrepreneur. It can be a huge improvement compared to the current scenario.
- Integration of different aspects and features and making two different groups of professionals come together.
- Tasks list and Trello integration.
- UI-UX is nice and simple
- Lipi, Expression analysis, I think this will also help entrepreneurs.
- the insight in the emotional activity and interference between entrepreneur and accountant
- Dat je tijdens het gesprek ook grafieken ed kunt laten zien
- The simplicity of communicating with each other

What are the things you would like to add to or improve in this product?

- Scores of various financial parameters should be explained for better understanding of the financial health. IOT and trends in the industry can be added. Timelines & alarms can be added, like tax returns, advance tax payment due & dates etc. Government compliance are completed on time.
- a focus more on providing entreprenuers with an overview of their financials either in the form of a dashboard or a daily newsletter can be helpful.
- Personalisation/customised experience will be appreciated, i.e. setting own goal, industry-specific tips, "what others in my industry are doing that I'm not already doing". Display impact of each action, like if I do this task, how much of an impact it'll have on my score and what does it means in the long run.
- 1. Allow customization/personalization (resize/ minimize/close say Things to Do panel). 2. Design to differentiate information based on for consumption or actionable (Overall Fin health trend: upward / How to improve suggestion: Try to collect invoices on time). 3. Convey entrepreneurs that their emotions are being analyzed and recorded for better communication (say during signup).
- I see some improvements on the UI part. I also like to see some more specific examples of things that can be figured out by Centaur. Things that I cannot imagine right now. It should be possible to do more with the information at hand then telling me than financial basics.
- I think the application is great and the improvement in communication strengthened by emotional response tracking is the USP.
- More visual clarity on certain UI features (extra screens after touching a spot).
- Customized view for ratios/metrics that are more relevant and important for me.
- I think that in 2025 we are further, machine to machine is going to help the entrepreneur much more actively, no questions on when payments are coming in, that is going to be a given fact. Full focus on new business and that should be the core of the software product. Not sure what role the accountant will have in that.
- What if an entrepreneur has not than one accountants?
- Based on the learnings of this interaction also skill training could be advised and serviced
- I am afraid this will not be adopted by accounting firms because the accountant can't be present every moment of the day. Also it's necessary that the figures are up to date. At this moment that's a great wish but bad enough not realistic. We cannot check all clients every day. Without check, we can't make any conclusions or advise. Very dangerous! So this is something for the far future and involves a totally other way of auditing. You can't change that by tomorrow. But the vision is good and I will be the first to adopt that when we are in control with this new way of communicating!