

# The Future of Adult Social Care

Visual report on the development of new adult social care models  
for the UK in 2030

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# Introduction

This essay is a report and reflection by me on a project named '*Adult Social Care - Design Methods in Social Innovation*'. Its aim was to apply our learnings about design thinking in a social innovation process and discover new research methods.

The core problem that we needed to tackle is that the NHS will have a £13 billion deficit on an estimated adult social care budget of £21 billion in 2030 (Groves, 2016), which is equivalent to 62% of the total expected budget for 2030/31 (Health.org.uk, 2015).

Our team, existing out of *MDes Service Design* and *Social Innovation* students, took this social innovation approach to question the current situation of adult social care in the UK and design a speculative and sustainable model to fill the gap for the year 2030. We structured our design process according to the *Double Diamond* in four phases – *Discover*, *Define*, *Develop* and *Deliver* – that also built the foundation for this essay.

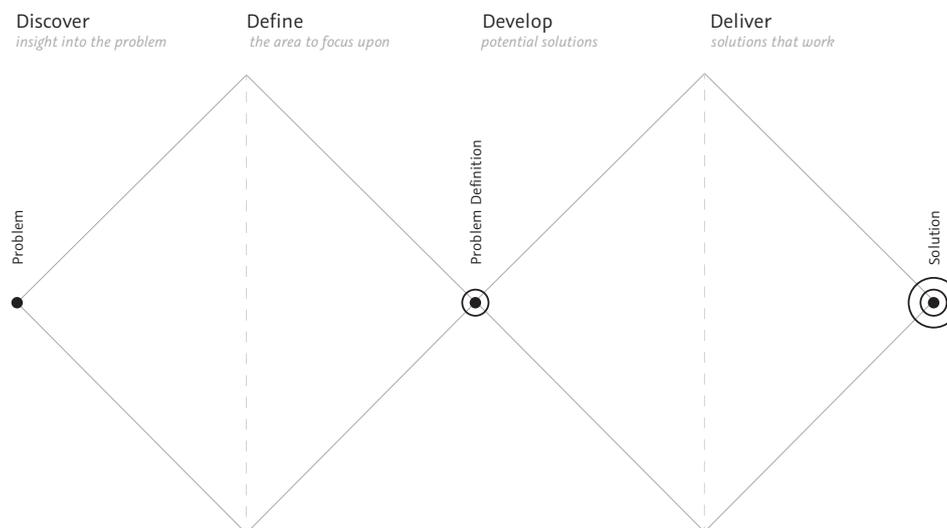


Figure 1: The Double Diamond process

In the *Discover phase* I'll outline our research, clarify why the UK is in an adult social care crisis. Followed by this I'll depict how we came with this huge amount of information to the final problem definition in the *Define phase*. Once we converged our research, we started to develop ideas in the *Develop phase*, evaluated them according to the design thinking *Venn diagram* and prototyped six possible solutions for the key areas work, housing, technology, health, awareness and finance. Finally, I'll show our process in the *Deliver phase*, where I present a preventative health solution that I developed.

Over all four phases of the *Double Diamond* process we did over 20 interviews and feedback conversations with involved people and experts from different countries. Through these interviews and our literature review, we realised that the adult social care crisis is a prime example for a social innovation solution approach, because it's part of a global problem that affects everyone – through family, as a tax payer or later as a care receiver.

We also understood that this may not be a problem that can be solved internally, by politicians or other social care institutions, because our greatest weakness – the lack of deep knowledge about the system – was actually our greatest strength, since we had a very naïve and unbiased view on it.

The whole project was so immense and overwhelming for all of us that I felt very hard to summarize it here in an essay. Social care's influence in every aspect of our society made it incredible hard to find boundaries within over the project – from defining the problem to agree on a solution.

# Discover Phase

## Social Care Crisis in the UK

The British adult social care system is as described above in a very fragile condition. There is a decrease of the social service support for adults since 2009 from although the tax revenue and the health expenditures rose in the same time<sup>1</sup>.

The current assumptions are that the budget for the NHS falls to 7.1% of GDP in 2030, which is a smaller share on health care than countries such as Germany, France, Denmark, Sweden and the Netherlands were spending in 2012 (Roberts et al., 2015).

As described above, the funding gap for adult social care will be over £13 billion by 2030. This funding gap caused already a decrease of the number of older people accessing publicly funded services by 400,000 since 2009. Moreover, the median average salary is with £14,800 a year nearly half as low as the median average UK salary of £27,600 for full time workers. Ultimately this resulted recently in a massive escape out of the social care working sector: More than 900 adult social care workers a day quit their job in the UK last year (Rhodes, 2017).

## Initial Research

As an introduction to expand our horizon we were given a series of provocative fictional stories that pointed out a possible future of adult social care<sup>2</sup>, that showed a quite negative future<sup>3</sup>, because they felt restrictive, authoritarian and not human-centered.

After this we brought questions together which thought are important (*Figure 2*). Then we tried to answer the easiest or most obvious questions with literature, which was submitted to us.

With the new knowledge of our literature research we created a stakeholder map (*Figure 3*) for the adult social sector in the UK. We saw that most of the relevant institutions and groups have a high interest and high influence into the sector. No one had a low priority, which proved again the importance of the problem, because everyone in our society is in some way affected by social care. We planned our following primary research with this map and tried to get in contact with as much institutions and groups as possible.

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<sup>1</sup> The decrease from 2009 to 2013 was from £18.2 billion to £17.2 billion (NHS Digital, 2017). The tax revenue rose about £116 billion and the health expenditures rose from £113 billion (17,7%) to £141 billion (19%) (Gauke, 2015; Gauke, 2016; Timms, 2009).

<sup>2</sup> One extrema represented a society where the government transferred all state-funded services into the empowering of local communities and the other one a society where global private companies had complete control over the citizens. Then there was a further one which was a hybrid approach of these both, where the government provided social care together with the private sector.

<sup>3</sup> Ideas like controlling everyone's behaviour in their most private premises (*An Ideal Partnership*), providing care based on merit (*The New Big Society*) or payment depending on the individual lifestyle (*Corporate Control*) were ideas that sounded like great ideas for a follow-up of George Orwell's 1984, but not like the future we wanted to live in 12 years.

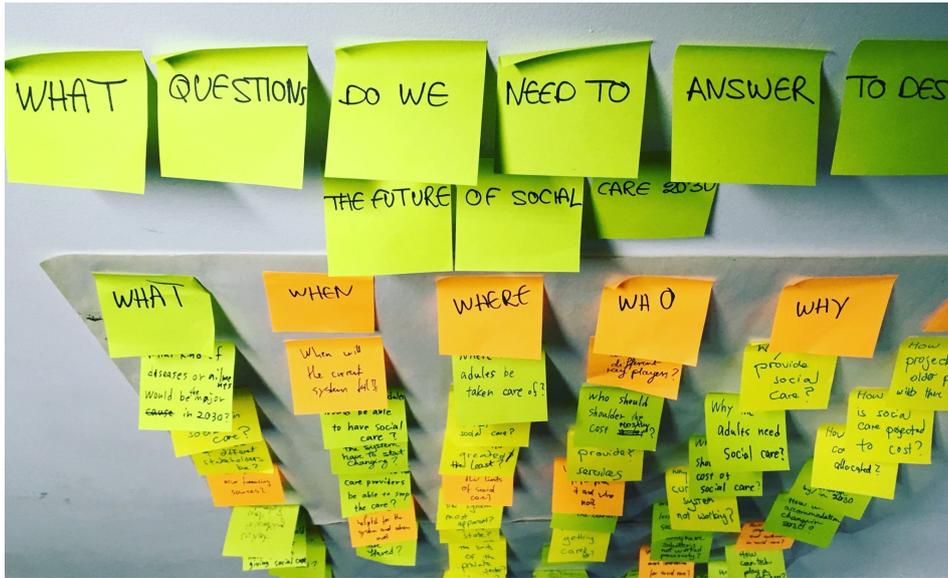


Figure 2: Brainstorming questions



Figure 3: Stakeholder Map

In our interviews (*Figure 4*) we found out that people from various backgrounds<sup>4</sup> criticise the current care system, but they all accepted it in some way. Especially carers and care receivers suffered from disorganisation and an 'one-solution-fits-them-all'-mentality. All interviews at the beginning were slightly helpful, because for most of the time we were just confirmed in our opinions. They were inspirational but widened rarely my perspective. Mainly this was caused by the limitations in our network and the time pressure. Nevertheless, we realized this insight very late in the process, which is why the really evidence-based analysis was neglected at the beginning.

	<i>Background</i>
Rita Billinghurst	Informal carer
Takashi Fujimura	CEO of Japanese social venture platform
Hermann Schröder	Patient in German retirement home
Maria Smolar	Alcohol Programme Manager, Public Health England
Jayne Edwards	Informal carer
Hillary Carter	Rehab and Reablement Team Manager, London North West Healthcare NHS Trust
Phil Veasey	Public Health Consultant
Michelle Lowe	Deputy Leader and Cabinet Member for Housing & Health
Pia Schulz	Recruiter for temporary workers in the health and care sector
Rob Miller	Director of ICT, London Borough of Hackney
Mandeep Soor	Senior Manager, British Business Bank
Matthew Cain	Head of Digital, London Borough of Hackney
Jim Thomas	Patient in German care home
Amy Cohen	Retired nurse, Princess Royal University Hospital
Samatha Hawley	Nurse, Princess Royal University Hospital
Parwis Azimi	German doctor, Association of the Scientific Medical Societies

*Figure 4: Our interview partners during the whole process*

Personally, I would have loved to interview people from the outside of London at this point. People from the landside, who have a different and maybe also more controversial perspective or people, who really tried to change the problems of the system.

<sup>4</sup> In this case carers, nurses, employees of authorities, informal carers and care receivers.

## Prevention and Independence

*“We need a radical new approach to our health and well-being as a society”*

*– Hilary Carter (London North West Healthcare NHS Trust) in an interview*

Later in the process we started to interview people with more varied backgrounds to widen our input of inspiration and knowledge. By this, we could find out from a German recruitment company that flexibility and other incentives are very important for people nowadays and that the conventional care sector could learn from this. We learned that the two main problems nowadays are demographic change and poor nutrition of the younger population and that we also need “a radical approach” to our health and well-being as a society. One interview partner said that ‘2030 will mostly depend on if we are able to change the concept of looking after ourselves so that care and health costs can be prevented’. Another one told us that its inalienable to keep up the independence of the people and that ‘health and the access to relevant information to this is a central issue here in the UK’.

## Interview with My Doctor

My doctor Parwis Azimi was one of the persons who pulled me out of my comfort zone and told me things that I didn’t expect. Our conversation was totally coincidently, and I think exactly this is why it was so different from the others.

With his background he said that the only way to avoid the upcoming health and social care crisis is prevention. Any attempts to fight the consequences of the western lifestyle ‘are senseless, if we don’t try to reduce the amount of people that require long term care’.

But he also argued that only possible to try to change the behaviour of individuals, but not of the whole care and health industry. It would simply be against the interest of them and all those who are involved like the pharma, food and retail industry<sup>5</sup>.

Knowledge is the key for this in his option. He gave me the example that the public falsely thinks that diabetes is caused by a sugar overconsumption<sup>6</sup>. If the people don’t even know the reasons for all these diseases, how are they supposed to protect themselves from them?

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<sup>5</sup> He gave me an example of how he tried in 2003 together with the *Association of the Scientific Medical Societies Germany* to force huge food corporations to use 10% of their advertising budgets for creative advertisements about healthy food and age-appropriate health care<sup>5</sup>.

In 2009 he talked with the former German health minister Philipp Rösler, who said to him that he had read the proposal, but that they didn’t consider it because of the interests of the pharma and food retail industry.

<sup>6</sup> Prediabetes and type 2 diabetes are caused by a drop in insulin sensitivity blamed on the buildup of fat inside our muscle cells (Greger, 2017).

## Interim Conclusion

At this point I had the assumption that prevention could be the solution and that the lack of knowledge was one of the key problems.

Until this point all the information seemed to me very unconnected. For a very long time it felt like the project went totally out of control, because of the incredible depth of the topic and the problem. I felt lost into all this information. The double diamond process made no sense in my eyes because every time we stepped every time two steps back after we stepped one forward. In the retrospect I agree that it was necessary for such a broad issue, but if you've never been through the process, you don't know how far you should go in the research process.

# Define Phase

The next step in our process was now to define the problem for the social care crisis. We took all our knowledge from the primary and literature research together and created a matrix with the root causes for the adult social care crisis (Figure 5). We saw that most problems have their origin in the society, environment and technology, which leads later to economic problems. The core problems were the increased demand through the growing ageing population and the unhealthy lifestyle habits and the decreased public funding allocations. Further catalysts were technology, housing and the lack of awareness in the public. At the top were the workers in the social care sector that suffered from all these structural problems.

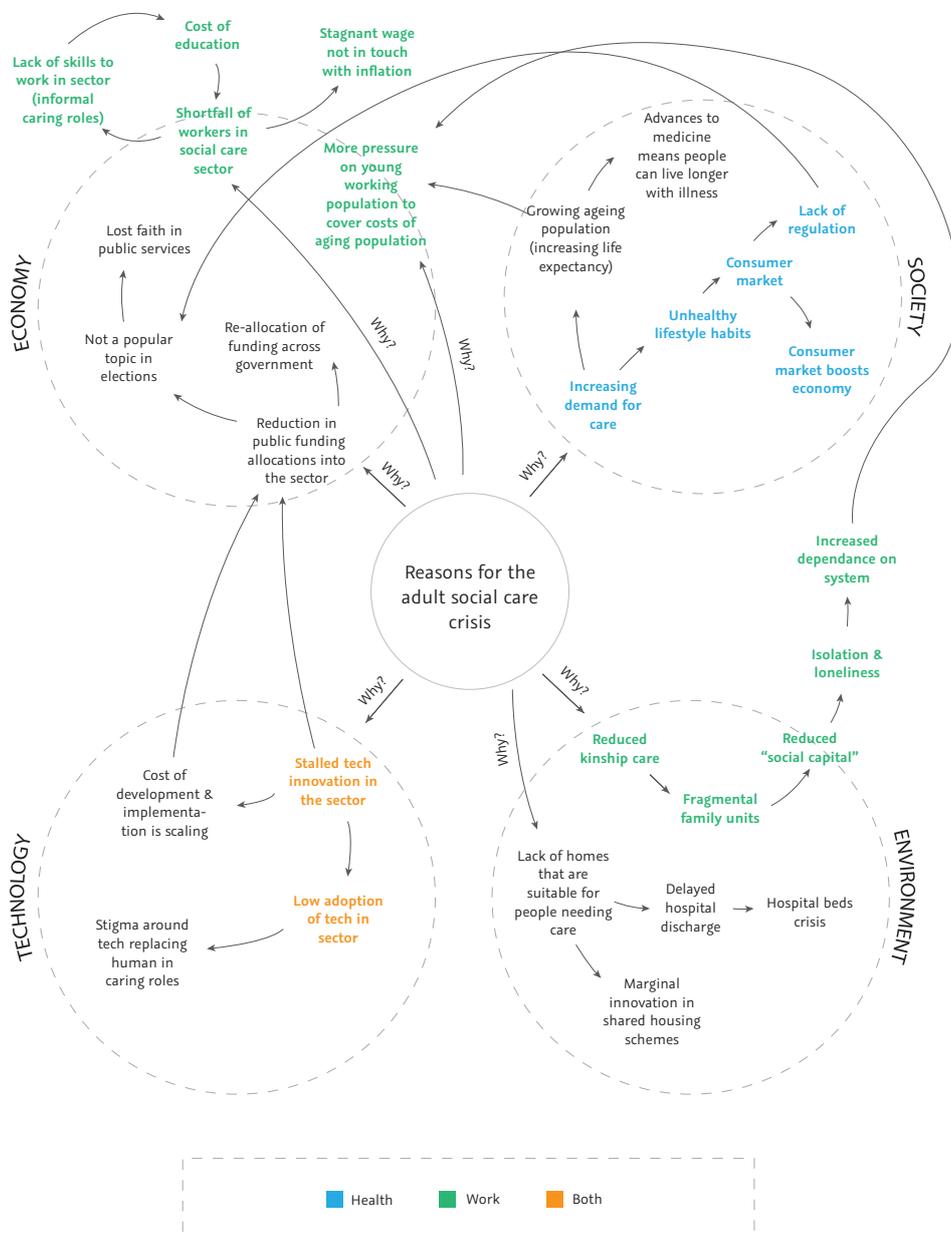


Figure 5: Systems map

## Innovation Briefs

To find a structure within this huge amount of problems, we came up with five areas (work, housing, financing, technology and awareness) out of which we created innovation briefs to have a foundation for to the Develop phase.

	<i>Challenge</i>	<i>Need</i>	<i>Opportunity</i>
<b>Work</b>	Workers are leaving the social care sector	Find incentives for people to work in the sector (again)	HMW attract and retain people to work in social care?
Housing	Living and housing costs are too expensive	Make living and housing affordable fo elderly people	HMW create and scale innovative models that reduce cost of housing for communities?
Financing	Huge funding gap of £13bil in 2030	Guarantee sustainable and fair financing streams for the society	HMW incentivise stakeholders to introduce innovative funding models?
Technology	Leveraging technology to reduce the costly human element in social care and improve quality	Provide better and more affordable social care	HMW develop innovative technology products that elderly people can and want to use?
<b>Health</b>	People are living unhealthy and create immense costs to the health and care system	Reduce the costs of effects of unhealthy lifestyle	HMW enable people to live healthy and independently longer?
Awareness	Social care is not a popular topic in the public	Raise the awareness for social care	HMW change the public perception on social care to put political pressure on it

Figure 3: Innovation briefs for our six highlighted areas

At this time, we didn't even consider prevention in any way, especially not health prevention. Our whole concept was based on the idea of keeping the people independent at home, but not keeping the people away from the need of care. More or less all our ideas were concepts to mitigate the consequences of the broke social care system. I think this small but crucial mistake was the root cause for the mess that we had after this step.

We came to premature conclusions due to incomplete or incorrect information. We only considered what we heard in our interviews and read in literature reviews ("What you see is all there is" - WYSIATI<sup>7</sup>). Also, all our questions on which we based our first research, were questions that were already available

<sup>7</sup> This cognitive bias was named by Daniel Kahneman in his book "Thinking, fast and slow" (Kahneman, 2015). Unfortunately, I've read the book at exactly the time we did the project, but I didn't realise that the things he was telling in the book are happening at this moment to me.

in our mind. We just wrote down what we knew, because we thought that this is enough. We didn't exit our comfort zone. Later interviews showed us that health and prevention was so essential for finding a solution. But we did these interviews when we already stepped into the develop process, because we thought our five innovation briefs covered everything.

After many iterations we added 'Health' as a sixth key challenge. Another problem with the innovation briefs was that we equalised all problem areas, although the root cause analysis showed a more multifaceted picture. The housing problem for example was just a small area compared to the others and less important than the finance or health problem. Our mistake was that we didn't agree on one direction, so we wasted many hours nearly the whole period at looked at six problems at the same time.

## Correcting the Direction

Based on our systems map (*Figure 5*) the conclusion should have been in a nutshell: There is a social care crisis, because more people need social care and less people work in social care. The reasons aren't the technology or financial sector, the house or labour market and neither not the lack of awareness. These areas are catalysts, not root causes, and no one of them would decrease the demand<sup>8</sup>.

I won't say that it's not necessary to tackle these problems, but a social innovation should always tackle the root problems rather than the symptoms or consequences (Murray, Caulier-Grice and Mulgan, 2010).

## Reasons for Increased Demand

To define the problem of the adult social care crisis further, I looked at the demographic change and the unhealthy lifestyle in the UK.

The demographic change in the developed countries is mainly caused by the slowed population growth. The IWF assumes that this causes a reduced per capita growth in the developed countries (Callen et al., 2006). Mail Online write that the £13billion shortfall of adult social care is only caused by the population increase of over-65s by almost a third and the shrinking working-age population to only 3 per cent by 2030 (Groves, 2016). The rising demand for social care with a simultaneously decrease of the economic performance will lead into a dilemma for every country in the long term.

But neither the original authors of the paper, nor other institutions like Mail Online didn't mention the increased unhealthy lifestyle as a root problem. They just referred to an essay from Public Health England, in which they are writing that 'Sin Taxes'<sup>9</sup> can be a solution to fill the financial gap.

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<sup>8</sup> This is why we could make the social care sector more efficient through technology and contemporary organisation structures. Or we could make it more attractive for workers to work in social care through a better working environment, more flexible work and higher wages. We also could promote contemporary ways of living together. We could start a nationwide campaign to raise the awareness of the problem and to force politicians to do something. We could increase the budget through higher taxes, but none of these approaches would decrease the demand.

<sup>9</sup> An introduction of a new taxation on specific consumptions on e.g. sugar, meat or dairy products, could be a preventative and sustainable solution to reduce the health and care expenditure and generating new income at the same time. When we would just include the hidden costs like long term damage to the environment and health care system and the subsidies into the actual price, a single Big Mac would cost \$200 (Patel, 2011). We talked to people from government authorities and other institutions and they just don't see it politically feasible right now. In the paper of the Health Foundation is shown that there is currently no evidence

## Impact of Lifestyle Related Diseases

Until today I absolutely don't understand how 'experts' that are researching about the social care crisis don't write as much about the rising unhealthy lifestyle as about the demographic change.

It is proven that the five major non-communicable diseases (NCDs) coronary heart disease (CHD), cancer, diabetes, dementia & Alzheimer and COPD are heavily influenced by diet (Booth, Roberts and Laye, 2014). Only 16% of all NCDs are genetically related – 84% are related to lifestyle (Hoeger and Hoeger, 2010). Public Health England claims that four out of five middle-aged adults in the UK are currently at risk of disease because of their lifestyle (Pickover, 2016), while an unhealthy lifestyle could cost them up to 27 years of their life (Knapton, 2015).

70% of all deaths worldwide are fuelled by diet and lifestyle factors (Donnelly, 2017). Also 70% of the whole UK health and care budget is spent on long term chronic diseases, while only one third of the population account for over two thirds of the spending (Department of Health, 2011).

Britain's obesity levels are the second worst in Europe with six in ten adults obese, what leads to the fact that 10% of the current NHS budget is spent just on diabetes. *The Guardian* wrote that this single disease alone will bankrupt the NHS system within only one generation<sup>10</sup>.

The demographic change is worsening all these effects, because older people have a general higher risk of getting diseases, but we cannot change the reasons for the demographic change that is happening in the world. We can only try to handle it and prevent that they live healthy and independent for as long as possible.

## Defining the Root Cause

The *Define phase* showed me that the root cause for the social care crisis is besides the aging of the population is the unhealthy lifestyle. The whole phase was very confusing, because we didn't work self-critical enough. In my opinion the first five innovation briefs of our team about housing, financing, awareness, technology and work were in the retrospect counterproductive. They distracted us from investing more time into the root cause analysis of the general problem. It's hard for me to say this, because we invested most of the time into these five areas – even until the very end, because we couldn't agree on one solution.

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that the concept of sin taxes won't work (Roberts et al., 2015). I still think that this can be a problem, but it was a team project and my team perceived it unfortunately as too radical.

<sup>10</sup> £20.5 billion of the projected £22.9 billion total annual costs of diabetes by 2035/36 are expected to come from type 2 – a disease that is only lifestyle related. This assumption still excludes the loss of working days, early death and informal care costs that would increase it to £39.8 billion per year by 2035 (Campbell, 2012).



## Second Evaluation

Our team used an InnovaChart (Figure 7) to measure the innovation of our favourite ideas. Besides of tax breaks for social care employees – a solution that is clearly not viable<sup>11</sup> – only an idea about a life expectancy tracker had the potential to be a revolutionary social innovation.

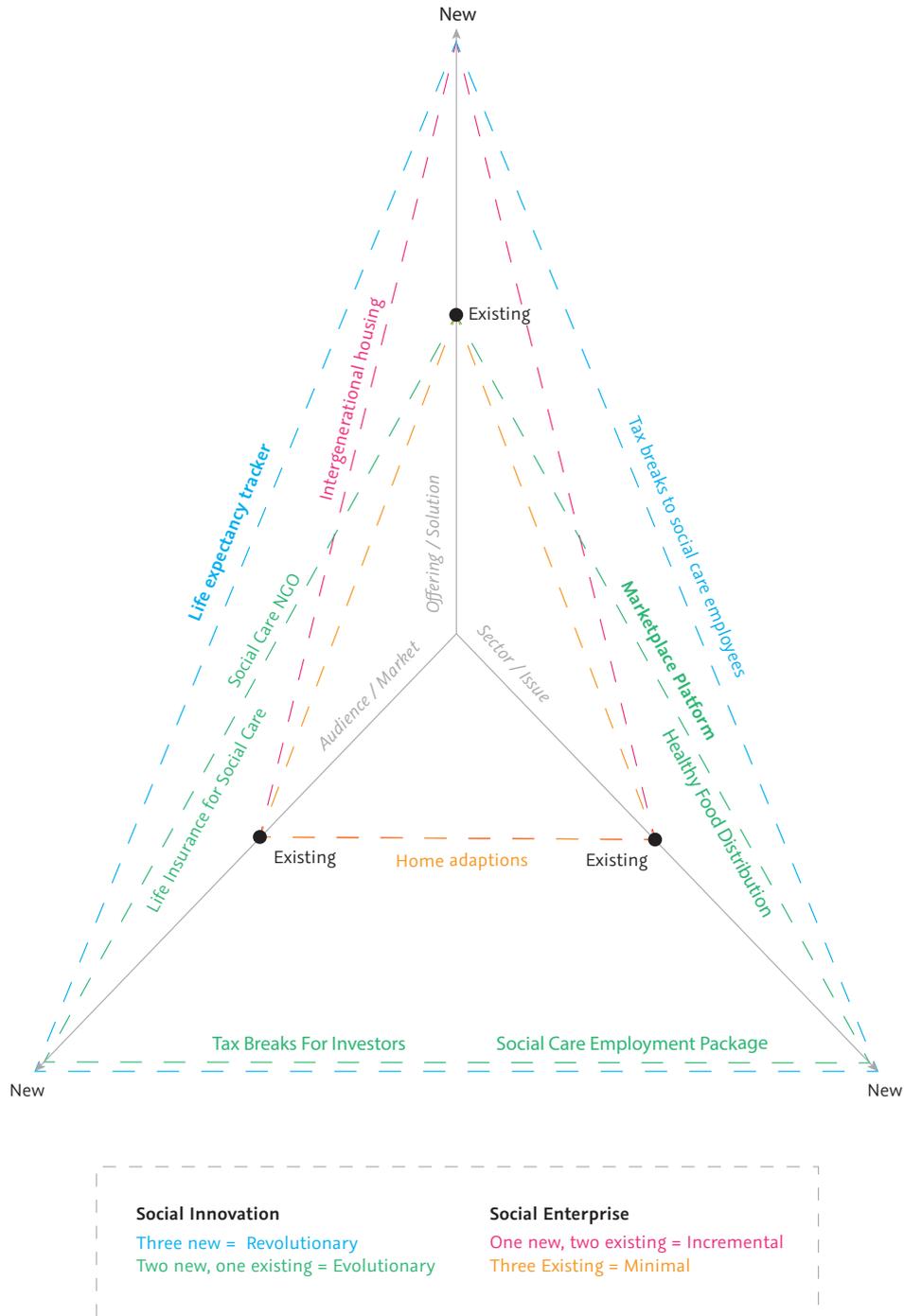


Figure 7: InnovaChart

<sup>11</sup> This is a great example of how bad our first evaluation process was: Moving the costs for the adult social care out of the health budget into the state budget doesn't solve any problem and is everything but sustainable.

## Six Solution Approaches

Just after this session and further interviews we finally realised that we didn't thought at any point about prevention. Before we started with the prototyping and after feedback on our ideas, we agreed that we need to prototype a health solution.

Later that day I had the idea about a free individual eating plan that the personal desires of everyone and manages the huge problem of lack of knowledge. Through individualisation of foods you like, you've a motivation to stick to it. I also thought about financial incentives to motivate the user further.

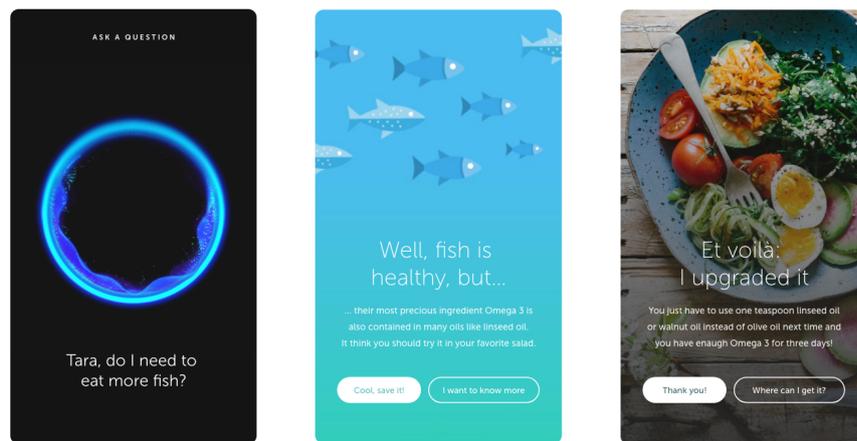


Figure 8: First prototype of the Smart Nutritionist (Health)

Outgoing from this I came up with the concept of a decent smart wearable that works over voice control and requires zero technical skills and zero buttons to use. It's provided by the NHS and is used to connect old people to a GP, to let them communicate to friends and family or as a reminder.

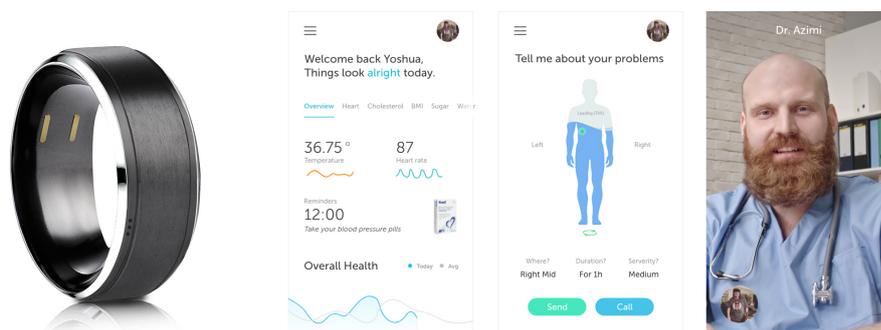


Figure 9: Smart Ring (Technology)

My fellow student Ben developed the prototypes for temporary home solutions, a social care NGO and a social care fund (all in Figure 11) and I created the prototypes for the Smart Nutritionist (Figure 8), Smart Ring (Figure 9) and the Care Finder (Figure 10).

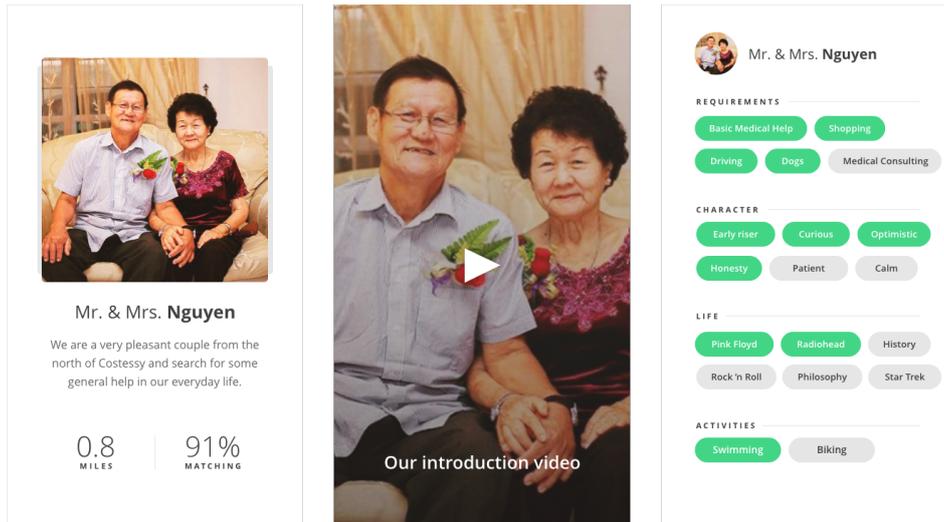


Figure 10: Care Finder (Work)

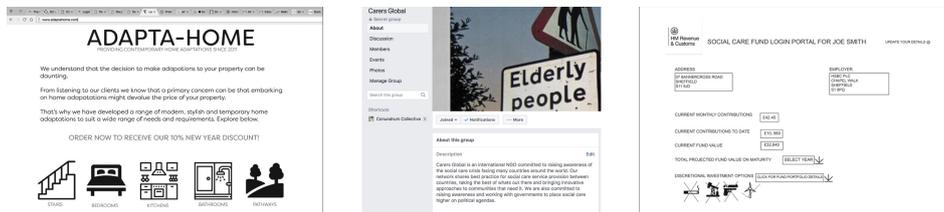


Figure 11: Home Adaptions (Housing), Social Care NGO (Awareness) and Social Care Fund (Financial)

## Feedback

With the prototypes we did several feedback conversations with people we've interviewed before. They made us realise that all our ideas are not convincingly and futuristic enough and that they could be developed right now or maybe in two years. Especially the *Care Finder* was liked by many people, but it "could come in the next 12 months, not 12 years", was something that we heard several times. The *Care Finder* tries to incentivise people to work in the social care sector by building the perfect working environment<sup>12</sup>. Although I really like this solution out of a carers perspective, it has clearly not the ability to fill the funding gap<sup>13</sup> and it also not tackling the root problem like I mentioned before.

The feedback conversations were without doubt the most important and valuable interviews we had over the whole process. The feedback conversation allowed us to recognise what people didn't understand and what we need to present better.

<sup>12</sup> This means flexible and independent working and scheduling, working with patients that fit your personality, interests and abilities most (based on an algorithmic calculated personality test) and work for an adequate wage.

<sup>13</sup> Basically, its biggest benefit from a financial point of view is that people can live for longer independently and don't need to move into a care home. The annual costs for all patients in residential long-term care facilities are £11.6 billion (ons.gov.uk, 2017). So, even if we calculate with 30% more costs for the next 12 years on top, then the solution would require that 90% of all current and future care home patients go back to their homes again (what is absolutely impossible accounting to our interview partners) and use the service everyday – for free. When the government would pay the carer a wage of £1500 per month and the patient would pay in addition to this £1000, the carer would have a UK average wage. In this scenario the patient is burdened much higher than before and the government would save £2000 per patient per year assuming that the patient doesn't have to go into long term residential care. The savings per year would be £1.1 billion per year. That is 5% of the funding gap in 2030 assuming the impossible that the government is replacing *all* long term residential care homes in the UK with this service.

## Deliver Phase

### Existing Solutions

Before I took a second approach for a personalized digital nutritionist I looked at existing solution after this was recommended to us in the feedback<sup>14</sup>. I've found the App *Easy Meals* (Figure 12) by the NHS, which inter alia recommended parents to cook for their children meals with processed red meat – a group 1 and group 2A carcinogen<sup>15</sup> that also increases the risk of getting diabetes by over 50%<sup>16</sup>. It seemed like that not only the majority of the people, but also the parts of the NHS don't know how to prevent NCDs like heart diseases, cancer or diabetes.

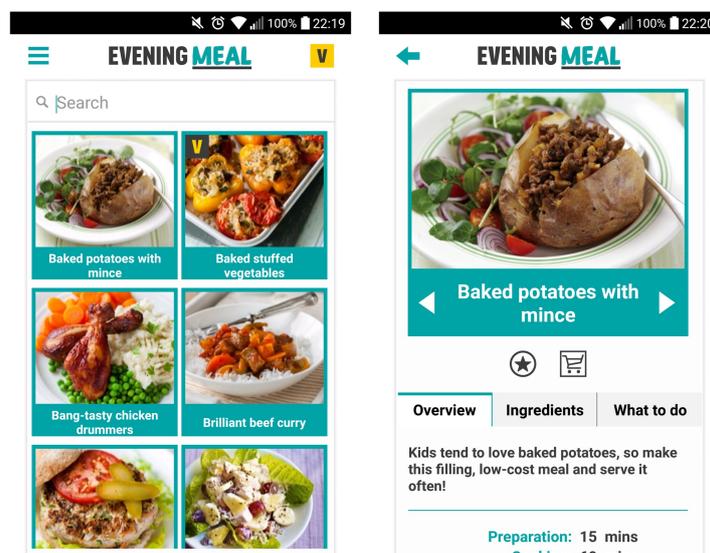


Figure 12: Easy Meals by the NHS

### The Smart Nutritionist

If we want to inform the people about nutrition and prevention, we need to know exactly what is good for them and how they can implement these information in their life. The whole concept behind the Smart Nutritionist is build up upon this problem. It takes the two biggest obstacles of ignorance and comfort through easily accessible personalized information.

<sup>14</sup> A cabinet member for housing and health gave us the feedback that the NHS would already have an existing solution for healthy food recommendation. Although this completely ignored the main features – the AI personalization – it was a good point that we didn't look up before. When I opened the "Easy Meals" app, which would be the most similar one, the first receipt I've got recommended was "Baked potatoes with mince" with the description: "Kids tend to love baked potatoes, so make this filling, low-cost meal and serve it often!" (Figure 12).

<sup>15</sup> Processed meat (like the recommended salted and low-fat mince) is classified by the WHO as a group 1 carcinogen that is proven to cause cancer. Also, the red meat itself is classified as group 2A carcinogen, which means that there is a strong evidence that it can cause cancer – especially to children (iarc.fr, 2017).

<sup>16</sup> In 2010 a meta-analysis found that red meat is a major risk factor for type 2 diabetes. Only 50g of red meat per day increase the risk of getting diabetes by 51% (Micha, Michas and Mozaffarian, 2012)

To build everything upon the most personalised data, we decided to make the whole *Smart Nutritionist* DNA based and make a huge health meta-analysis of existing studies to remove any doubt about what is good and what is not.

*"I like the idea, because it empowers the younger generation.  
They can make the difference."*

*– Hillary Carter, Rehab and Reablement Team Manager*

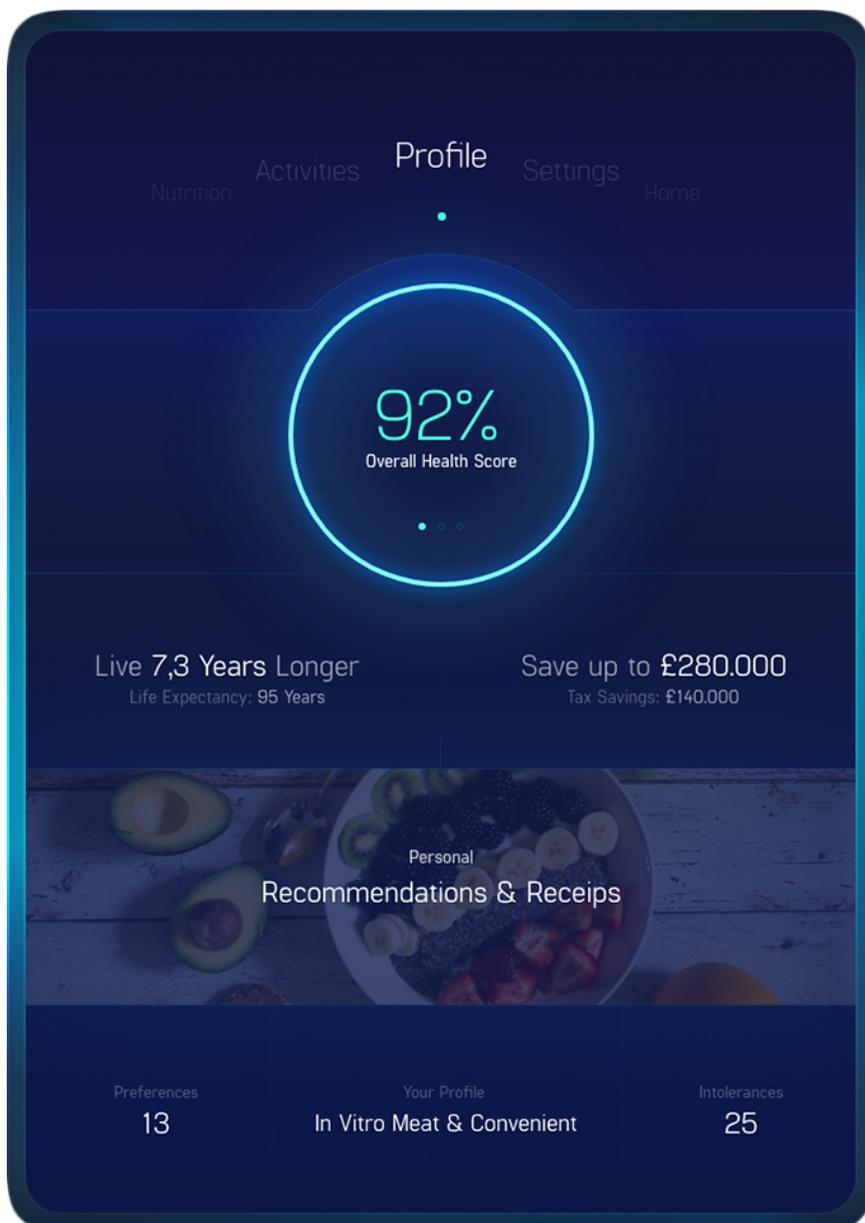


Figure 13: Profile overview of the *Smart Nutritionist*<sup>17</sup>

<sup>17</sup> The user interface has only illustrative purposes and does not reflect how the actual *Smart Nutritionist* would be used in real life. The acceleration of technological development is increasing nearly exponential and less linear, so I personally do not think

Figure 13 shows its features how the program could look. An algorithm calculates an intersubjective health score from various parameters<sup>18</sup> and the DNA<sup>19</sup> to calculate a precise life expectancy. Once a lifestyle is measurable and comparable, improving it gets a way more tangible aim for everyone that comes from an intrinsic motivation.

The immense cost savings from nearly £400.000 per Person per life<sup>20</sup> and the resulting tax relief are primarily used as extrinsic motivation to get people involved in the project and to facilitate the difficult transition of living an unhealthy lifestyle and living a healthy one.

To track real-time data<sup>21</sup>, we decided to use the *Smart Ring* (Figure 9 and 14) as a technology to bridge the gap until the human body itself is connected with the *Smart Nutritionist*.

## Human-Centered Approach for Privacy

*"The adult public's taste is not necessarily ready to accept the logical solutions to their requirements if the solution implies too vast a departure from what they have been conditioned into accepting as the norm."*

- Raymond Loewy (Raymond Loewy, 2018)

In the future it should be possible to save your DNA in a blockchain so that only you and your program can access it<sup>22</sup>, which would be the solution to make it riskless and desirable for everyone.

Although all data that are created and managed by this program are safe against data abuse through the blockchain technology, it would be clearly too much to expect from everyone to wear a ring for your whole life which tracks you all over the time. Some people will clearly not like or accept it, which would exclude a huge amount of the population.

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that we will use - besides of work - touchscreens as the main input method in 2030. Applications like this will be managed by voice and gesture control, the two lowest input thresholds after thought control.

<sup>18</sup> It's a score that represents all essential health factors including nutrition, lifestyle, stress, location, age and activities. A score of 100% for example would be the best state that a body could achieve in its whole life. It's also important to show how the health of a person would develop in the future through aging. This referencing system is necessary, because the average person can't process rational information like "eating meat raises the risk of cancer by 18%". Information like these are immediately forgotten without reflecting. Our emotional consciousness doesn't want to deal with this because it has a positive emotional attachment to the meat and our rational consciousness can't classify the 18% because it has no reference value (like output value or time window) for it (Kahneman, 2015).

<sup>19</sup> This is required to consider for example genetically anchored diseases, metabolism, available enzymes and bacteria, biological happiness & stress level, heart function, blood pressure, intestinal flora, the insulin resistance level and the influence of the lifestyle to the DNA.

<sup>20</sup> Linear interpolation that is based on current data that the NHS spent £2.200 per person in 2017 (Full Fact, 2017) and the assumption that the average increase of the spending and inflation are together 3% yearly. The calculation is based on a person that reaches the age of 90 and uses the Smart Nutritionist for his whole adolescence (72 years). The costs would be £542.645 in this example and the savings 70% of this amount (equal to the share that the NHS is spending on lifestyle related chronic diseases), which results in £379.851.

<sup>21</sup> Like calorie intake and usage, stress and water level, blood pressure and other key information points.

<sup>22</sup> Everyone in our team had enormous doubts with security at the beginning, because we thought that it would be just crazy to give your own DNA to the government. But after reflecting on the idea, I thought about saving the DNA data decentral in a blockchain to spread the data in thousands of computers all over the world. This sounds crazy, but it's actually tested right now with the blockchain based currency *Bitcoin* (Genecoin.me, 2018).



Figure 14: The optional Smart Ring

Following the *MAYA principle*<sup>23</sup>, it would be the best to either offer solution that fits the whole population and is therefore not so advanced or to create two solutions - one advanced and one basic.

In this case the clear preference would be to decide on the second option: Users, who wear the ring, get advanced insights and are qualified for the tax saving program and users without it aren't able to qualify for the tax saving program, since their usage behaviour isn't trackable.

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<sup>23</sup> The designer *Raymond Loewy* always tried to give the user the most advanced design, but not more advanced than what they were able to accept and embrace. This is what he called *MAYA principle* (Most Advanced, Yet Acceptable).

## A Personal Companion

We think that in 2030 nearly every household in the UK will have a smart home device. If the user wants to, they can all be connected to the *Smart Nutritionist* (Figure 15).



Figure 15: Smart Homes will allow to use the Smart Nutritionist all the time

The experience goes beyond that. To enable a healthy and easy nutrition when you're not at home, cooking robots will be able to make personalised food for you in many restaurants of the future. Your *Smart Ring* recognises your current mood and feeling while *the Smart Nutritionist* knows your personal preferences, your taste and your needs.



Figure 16: Robots will be able to cook meals with the data from the Smart Nutritionist

## Promotion

Such a disrupting technology will have a massive impact on the society. Even people that don't use the technology, will be affected when the people around them change their lifestyle behaviour. It's all about raising awareness and increase the knowledge about this important topic.

What we want to achieve is a cultural change, because only this will be sustainable in the long term for the society. British celebrities could promote the Smart Nutritionist and the idea of living a healthier, happier and more fulfilling lifestyle. In 2016 China has done something similar after they updated their dietary guidelines<sup>24</sup>



Figure 17: Chinese celebrities Liu Tao, Huang Lei, He Jiong, Ni Ni, Li Cheng and Li Bingbing promote sustainable and healthy diets and reduced meat consumption in a nationwide campaign (Open Philanthropy Project, 2016)

<sup>24</sup> China updated their nutritional recommendations and decided to reduce its meat consumption by 50% until 2030. They did it for several reasons, but mainly to stop the worsening diet of the Chinese, to prevent the people from getting NCDs and to reduce the long-term costs through environmental damage. This was promoted by a nationwide advertising campaign which is represented by some of the most well-known Chinese in the world (Figure 19) and even former bodybuilding legend Arnold Schwarzenegger and director James Cameron promote it (WildAid, 2016).



Figure 18: Our adaption with the British celebrities Ewan McGregor, Meghan Markle, David Beckham, Emma Watson, Paul McCartney and Naomi Campbell

## Business Model

To prove that the solution isn't just feasible and desirable, but also viable, as our last step we created a *Business Model Canvas* (Figure 21). The canvas gave us a good overview over possible partners for the project and forced me to think more about the financial impact again, so I developed a finance plan (Figure 22) for the first five years afterwards.

<i>Partners</i>		<i>Activities</i>		<i>Value Proposition</i>		<i>Customer Relationship</i>		<i>Customer Segment</i>	
Google (DNA)		Health meta-analysis		Life expectancy tracker		Personal companion		Sick people	
Fitbit		Develop software		DNA-based recommendations (Food & Exercise)		Trustful partner		Middle & lower class tax payers	
Other Nations		Nationwide promotion		Benefits for insurance, mortgages and loans		Up-to-date info source		Self-improvement focussed people	
Media & Influencer		Provide wearables		Tax breaks		Knows your personality		Tech-Nerds	
IT corporations		Validation team		See how you look in the future		For young and old		Curious people	
Gym				Personalised food & shopping				Responsible people	
Sportclubs		<i>Resources</i>		Healthier, happier and longer life		<i>Channels</i>			
Food retailers		Platform		Free body analysis		Poster Campaign			
Food producers		R&D Lab				GP			
Celebrities		Supplier for Smart Ring				Social Media			
Nutrition association		Supplier for DNA				Scientific reviews			
Blockchain companies		User Support				Talkshows			
						News			
						Tech-Partners			
<i>Upfront Costs</i>		<i>Ongoing Costs</i>		<i>Costs for first 5 years</i>		<i>Savings for first 5 years</i>		<i>Additional income</i>	
£10m development		Research		£65,000,000		£43,000,000,000		Technology licensing	
£20m promotion		Improvement							
£10m research		Server		<i>Cost Benefit Ratio</i>		<i>Max savings per year</i>		<i>Benefit Cost Ratio</i>	
		Management		0.0015		£87,000,000,000		657	

Figure 13: The Business Model Canvas

With a conservative estimation<sup>25</sup> the cost for the first five years would be over £65 million, while the savings for the first years would be over £43 billion – this is a totally immense social return on investment (SROI) of 656. One Pound that the NHS would invest into this solution would save £656.

This result at the end of our journey was more than satisfying. It was totally overwhelming.

I estimated the costs and the return on investment earlier in the process, because otherwise I wouldn't be so confident about the solution until here. By building up our business model on the top of our creativity and not vice versa, we had a lot of more free room to be creative, but we gave up the safety that that what we are doing right now is also the viable in the end, which lead us to develop so many ideas that were totally not viable or profitable.

	2030	2031	2032	2033	2034	2035
<b>UK Population</b>	70000000	70350000	70701750	71055259	71410535	71767588
<b>Target Group</b>	56.000.000	56.983.500	57.975.435	58.975.865	59.984.849	61.002.450
<b>User</b>	100	500000	2000000	6000000	9000000	11250000
<b>User Share in %</b>	0,0000018	0,0087745	0,0344974	0,1017365	0,1500379	0,1844188
<b>Average Influence</b>	0,20	0,27	0,35	0,47	0,63	0,83
<b>Health Budget</b>	£175.000.000.000	£178.500.000.000	£182.070.000.000	£185.711.400.000	£189.425.628.000	£193.214.140.560
<b>PPPY</b>	£2.500	£2.550	£2.601	£2.653	£2.706	£2.760
<b>NCD Costs</b>	£131.250.000.000	£133.875.000.000	£136.552.500.000	£137.426.436.000	£140.174.964.720	£139.114.181.203
<b>NCD Share in %</b>	0,75	0,75	0,75	0,74	0,74	0,72
<b>Upfront Cost</b>	£13.000.000	£27.000.000				
Development	£5.000.000	£5.000.000				
Promotion		£20.000.000				
Analysis	£8.000.000	£2.000.000				
<b>Ongoing Costs</b>			£4.300.000	£5.917.500	£7.118.625	£8.182.050
Improvement			£1.000.000	£1.250.000	£1.375.000	£1.512.500
Promotion			£500.000	£625.000	£781.250	£976.563
Analysis			£1.000.000	£1.250.000	£1.562.500	£1.953.125
Server		£500.000	£1.250.000	£2.187.500	£2.734.375	£3.007.813
Management		£500.000	£550.000	£605.000	£665.500	£732.050
<b>Individual Costs</b>						
Smart Ring	£50	£40	£30	£25	£30	£25
DNA Test	£45	£40	£35	£30	£25	£20
<b>Costs per Year</b>	£13.000.000	£27.000.000	£4.300.000	£5.917.500	£7.118.625	£8.182.050
<b>Costs for 5 Years</b>						<b>£65.518.175</b>
<b>Savings</b>		£312.465.451	£1.666.552.168	£6.578.579.616	£13.161.577.680	£21.353.292.659
<b>Savings for 5 Years</b>						<b>£43.072.467.574</b>
<b>SROI</b>						<b>656</b>

Figure 14: Finance Plan

<sup>25</sup> Based on a total market penetration after 5 years by 15% or respectively 18% of the target group (approximately 85% of the UK population). If we compare the Smart Nutritionist to other disruptive technologies, the market penetration after five years would be maybe by 50% of the whole society (statista.com, 2018).

## Conclusion

I've shown that the root problems for the adult social care crisis are mainly the increased demand, which is caused by the slowed population growth and the increased unhealthy lifestyle of UK's population, and the reduction of funding allocations into the social care sector. While the last one has mainly politically structural reasons, the first one has mainly sociocultural reasons. Both of them are deeply rooted problems, incredibly hard to solve and associated with a lot of effort. But the second one, the increased unhealthy lifestyle, is the most accessible one has the biggest impact in the long term.

The solution of the *Smart Nutritionist* has incredible disruptive potential to make the life of the majority healthier, happier and longer. At the same time its approach of giving the power to the people with the blockchain technology and taking it away from current centralized systems is a human-centered vision that could be a social innovation for all areas of our connected future.

Through visualising long-term effects of lifestyle behaviour in the present, huge tax breaks, personalised recommendations, comfortable usage and the value proposition of a healthier, happier and longer life, the *Smart Nutritionist* combines as well intrinsic as extrinsic incentives to motivate people to live a healthier life. But I've also showed that it's not only desirable, but probably also feasible in the year 2030 and with a SROI of 656 also incredibly viable.

This outcome was only achievable through our intensive research and the many iterations that we went through. If we didn't hear again and again from our interview partners that prevention and keeping the independence of the elderly is the key to solve the crisis, then we wouldn't come up with such a solution.

During the project it felt like that we would never find a suitable solution. The constantly converging, diverging and following iterating felt like a loop that gets worse after every iteration, because the amount of problems we saw just rose every time. But once we came to a solution, all these worries dissolved. This is why it is so essential to go for one time through this whole *Double Diamond* process to experience the heights and downs. It allowed me to understand the whole philosophy of the design thinking approach.

*"If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem  
and 5 minutes thinking about solutions."*

*– Albert Einstein*

In the retrospect we could've avoided a huge amount of problems, obstacles and downs through focussing more on research to find the root problem and less on possible ways to solve the problem. Altogether the project had a lasting impact on my professional and personal life. It was a very challenging and inconvenient project that improved my understanding, strategy and view on solving problems through social innovation very well.

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