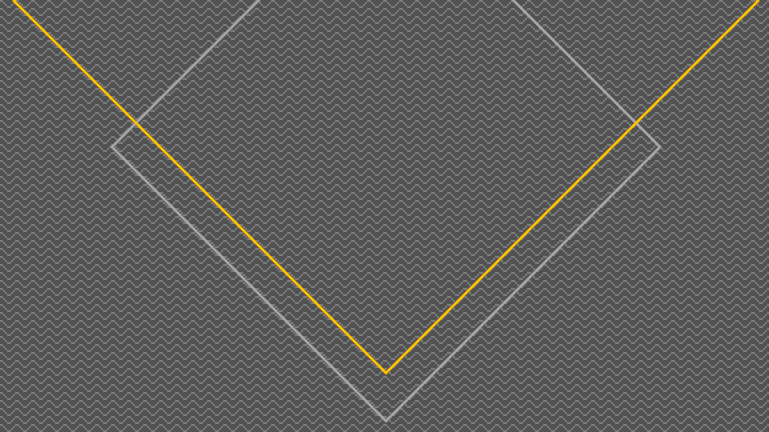




Management of New Product Development

Assignment A

Christopher Davies 2126255 Elin Davies 1702172 James Monks 2126850 Colin Jones 2125470

Assignment brief:

To demonstrate a systematic understanding of the key elements that contribute to the effective gathering of market knowledge required for the development of a chemical detection system (CDS)



**KEEP
CALM**

AND

**READ THE
ASSIGNMENT BRIEF!**

Project Scenario

Within your role as the New Product Development Manager within a Powys based SME you have been involved in a Knowledge Transfer Partnership with your local university. This knowledge transfer has identified the possibility that a modified variant of an existing product may have commercial possibilities and viabilities within a new market.

The opportunity would involve an existing alcohol detection unit being modified to allow the detection of organic materials apparent within the breath as a bi-product of infection with a virus or similar.

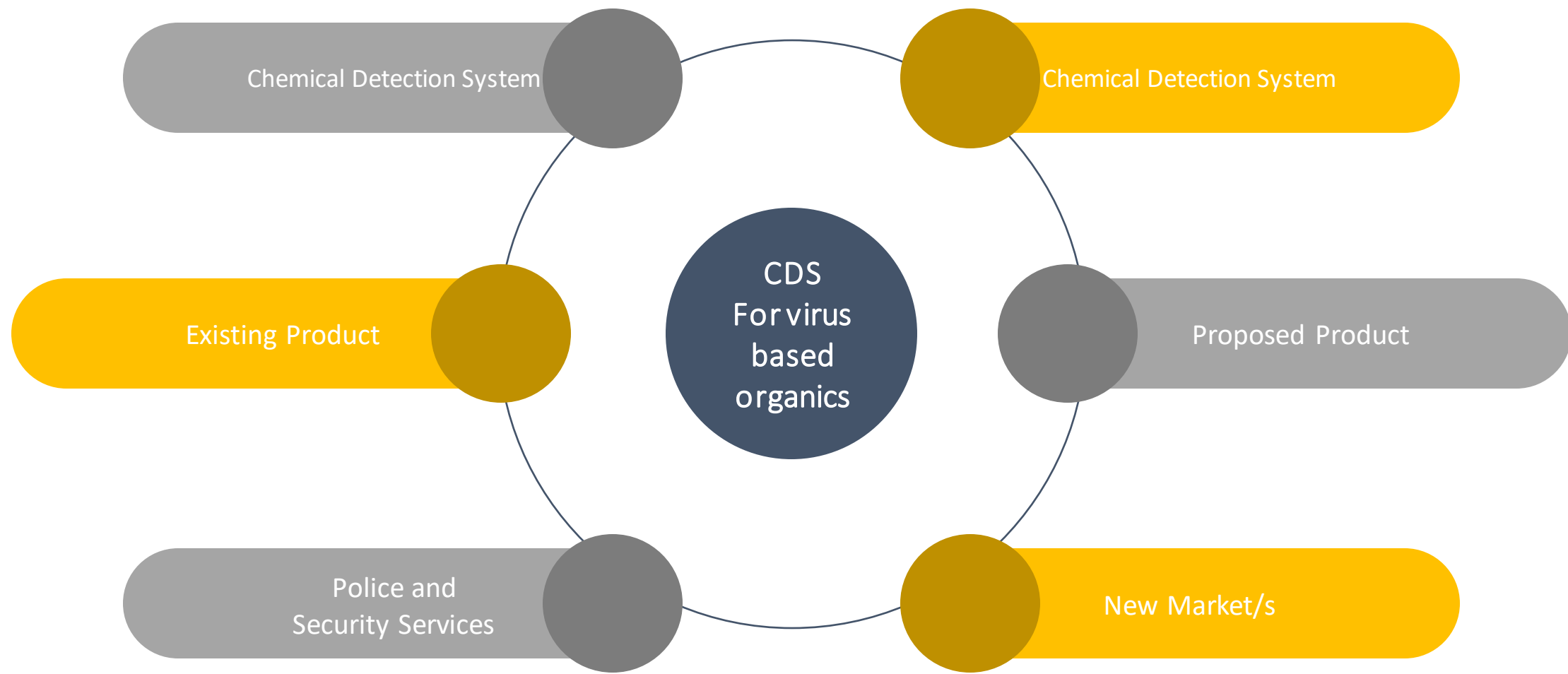
As this opportunity will engage the company within a new market sector it would be commercially prudent to establish if there is an actual requirement for this new product within this or other markets, as such there is also a requirement to determine what marketing knowledge is likely to be required prior to the development of this new product.



Section 1

1. Determine what marketing knowledge is likely to be required for the development of this new product.

Product Transition



What marketing knowledge do we require prior to transition into a new marketplace?

There is a well trodden path to establish defined product value, this can be indicated as follows and combine to offer market knowledge:

What do we already know?

What existing knowledge do we possess internally within the company.

What do we need to know?

In order to effectively develop a new product for a new market what do we need to know.

What do we need to address?

What existing knowledge do we need to address prior to entering a new marketplace.



The Path to defined value 2.

- “It follows that the crunch questions to ask in looking at this first stage of the strategic pathway are simple, what do you know? In particular what do you know that is not obvious to every rival in the business, what do you know that they don’t? Where does your superior insight give you a competitive advantage, an edge, a difference that matters, a way of delivering value better and to a higher level than the competition.”
- Piercy,N (2008) Oxford, Butterworth-Heinemann, Market Led Strategic Change.
- “The foundation for all that follows are the simple questions – What do you know, how does that knowledge give you an edge or advantage over the rest, how can you stay ahead in understanding this market opportunity better than anyone else. After that, the rest is just technology, a means to an end.”
- Harris,J (2022) Market Intelligence +

Management Information 1 (what do we already know).

- What – Is **our current position** within our existing market.
- Why – To understand how much influence our brand has within our existing market.
- What – Is our **current turnover** and profit margin from our existing product range.
- Why – To assist in our understanding regarding our ability to financially facilitate new product development.
- What – **Technical features** are embedded within our existing product range.
- Why – To assist in setting a potential base specification for the new product.
- What – Are the **technical limitations** of our existing design
- Why – To understand the level of technical modifications necessary to offer an effective product.
- What – Are our **existing manufacturing capabilities**.
- Why – To establish the capability to transition to a secondary product range.
- What – Is our existing **product distribution network**.
- Why – To establish if we can affect distribution of a new product range to a new marketplace.

Management information 2 (what do we need to know)

Market information

Do our competitors already offer this technology?

- Competitor websites
- Social media

Market information

Will our brand status or credibility transfer to the new market?

- Customer feed back
- Social media

Market information

What do our existing customers expect from our products?

- Customer feedback
- Chatbots

Management information 3 (what do we need to know)

Market information

Can we market the new product with our existing commercial framework?

- Trending reports
- Commercial engagement

Market information

In order to comply within the new market do we need product certification?

- ISO/BSI standards
- UKCA certification
- Medical device certification
- NATO stock number

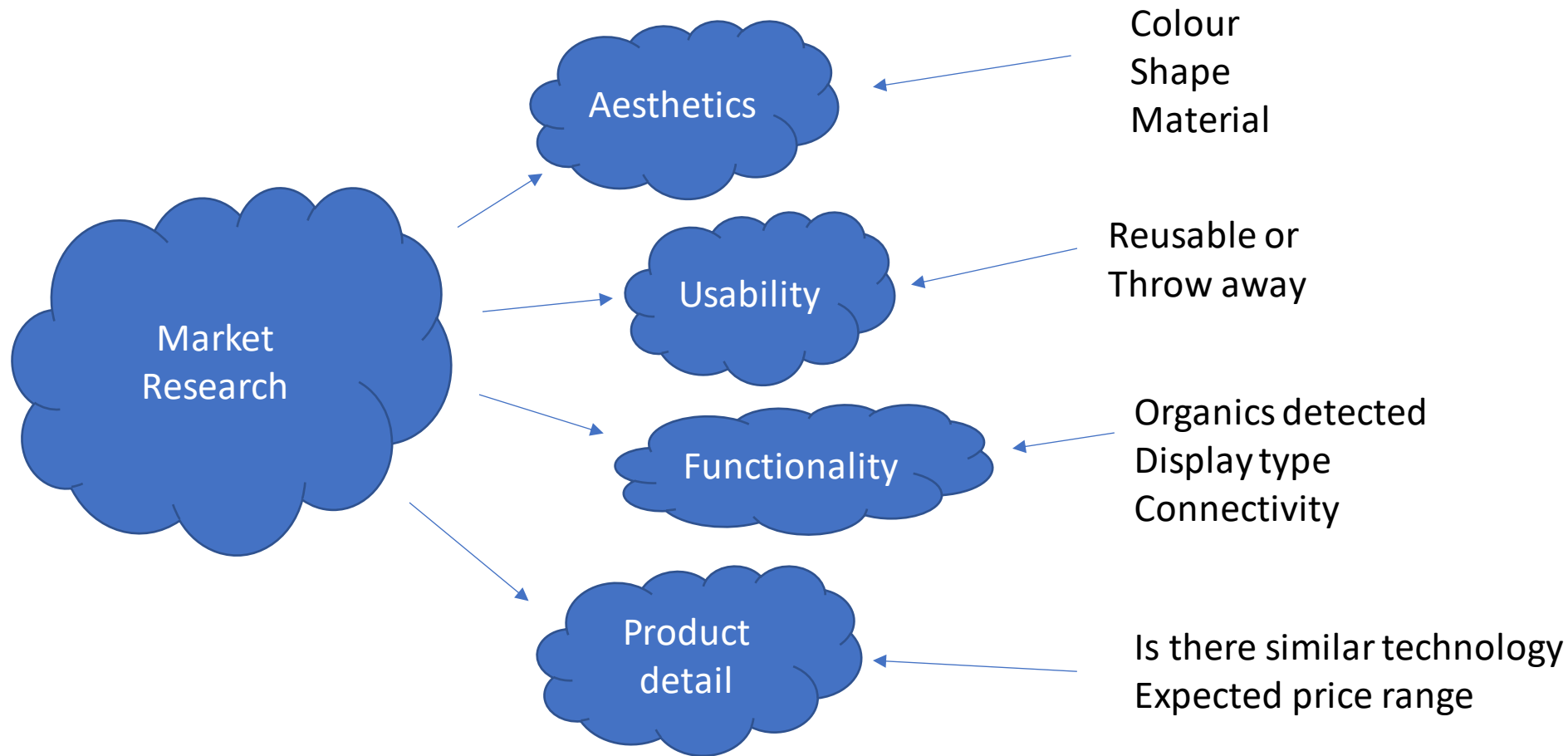
Market information

What is our anticipated time scale?

- Manufacturing lead times
- Mono-lateral planning

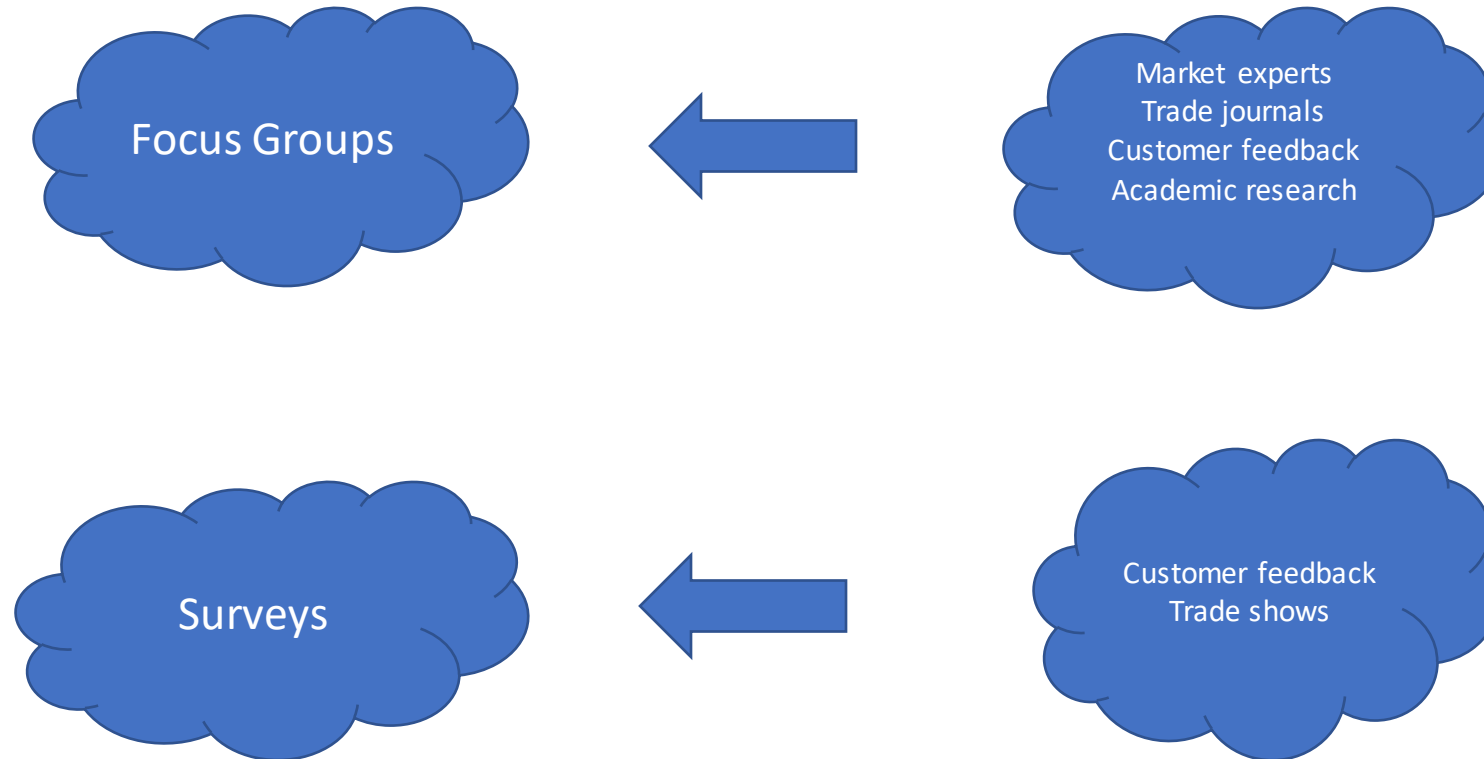
Market research 1

What do we need to know from external data?



Market research

Where do we locate this data?



Market Intelligence 1

What existing knowledge do we need to consider prior to entering a new market?



shutterstock.com · 1116947507

- What health issues are embedded within the market?
- What are the social trends to consider?
- What are the potential demographic influences?



Research via academia sources that have relevance to the new market.

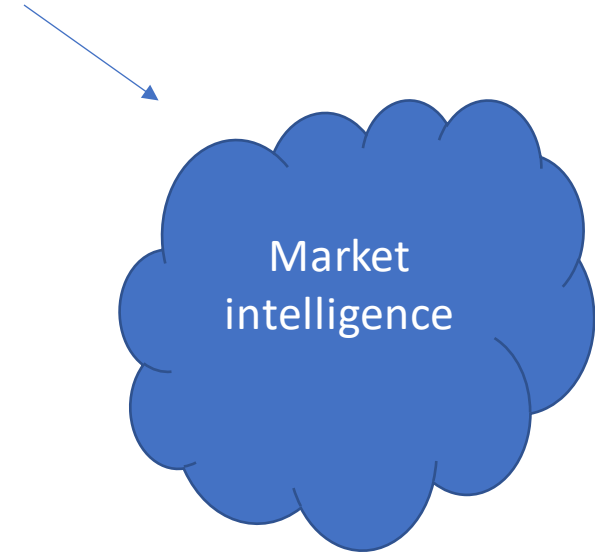
eg. Google Scholar, Sciencedirect, Researchgate, University research portals.

Market Intelligence 2

What existing knowledge do we need to consider prior to entering a new market?



- Is there political will to invest in the market?
- Are there import or export restrictions?
- What standards or certifications are required?
- What is the current public health policy?



Research via Government sources that have relevance to the new market.

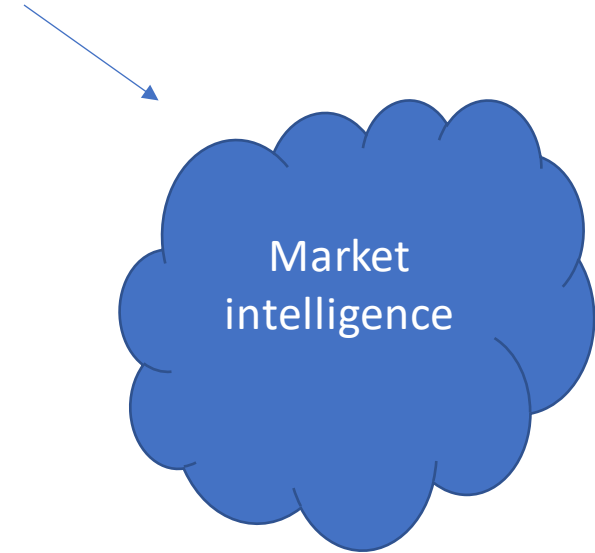
eg. Gov.uk portals, local political representation, manufacturing groups.

Market Intelligence 3

What existing knowledge do we need to consider prior to entering a new market?



- Is there similar technology available?
- What organic compositions could be detected?
- What is the expected product life cycle?



Research via our existing and new research partners, data that has relevance to the new market.

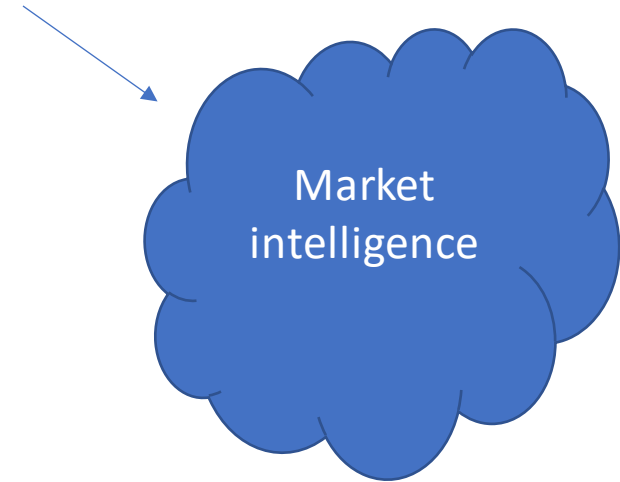
eg. UKRI, Quora, Emdesk, universities.

Market Intelligence 4

What existing knowledge do we need to consider prior to entering a new market?



- How will the market deliver commercially, who are our end users, what are the potential issues within the market?
- What diseases are likely to be prevalent within the market and how are they transmitted and detected?
- What is the attitude of the end user, where do they fit economically and socially, what is their general attitude towards personal and public health?



Research via market trend sources, data that has relevance to the new market.

eg. Mckinsey, Accenture, trade journals, academic research, social media, news, forums.

Market Intelligence 5

What existing knowledge do we need to consider prior to entering a new market?



- Who are our potential competitors?
- What do they sell and how is it marketed?
- Who is their existing end user?
- What is the sales price and how many do they sell?
- What are their strengths and weaknesses?



Research data that has relevance to the new market.

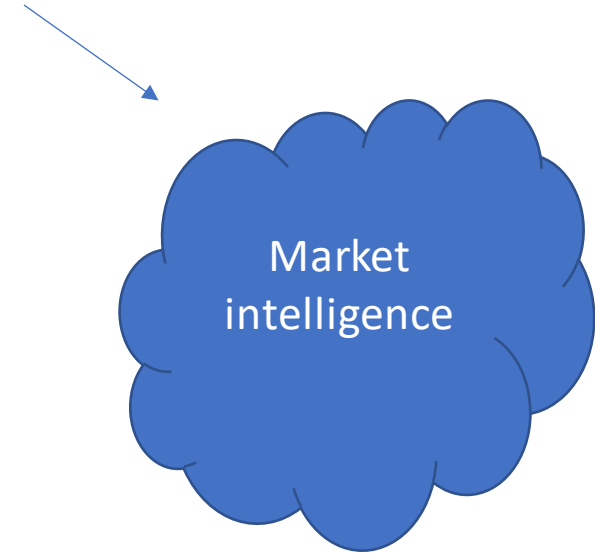
eg. Reverse engineering, blogs, linkedin, social media trade shows, web site.

Market Intelligence 6 open innovation

What existing knowledge do we need to consider prior to entering a new market?



- Will multiple input sources lead to a better end product and higher value for the end user?
- Do we have the design, development and manufacturing capabilities and capacity to manufacture an additional product stream or will we require a sub-contractor base?
- If we utilise external capacity will we require to address possible IP issues and formulate NDA's?



Should we use closed or open innovation methodology to develop this new product?.

Market Intelligence 7

What existing knowledge do we need to consider prior to entering a new market?

PESTLE Analysis

P	E	S	T	L	E
POLITICAL	ECONOMICAL	SOCIAL	TECHNOLOGICAL	LEGAL	ENVIRONMENTAL
Example: • Current tax policy • Brexit • Trade policies • Political stability • Government policy	Example: • Inflation rate • Exchange rates • Economic growth • Interest rates • Disposable income • Unemployment rate	Example: • Lifestyle attitudes • Cultural barriers • Population growth • Population age • Health consciousness • Target demographics	Example: • Level of innovation • Automation • Technological awareness • Cybersecurity • Technological change • Internet availability/speed	Example: • Employment laws • Discrimination laws • Health and safety • Copyright protection • Consumer safety	Example: • Weather • Climate change • Environmental policies • NGO pressure • Recycling • Pollution • Sustainability

<https://www.impact-innovation.co.uk/pestle-analysis>

Research data via PESTLE analysis that has relevance to the new market.

Market knowledge

How do we translate the market information, market research and market intelligence into the holy grail of Market knowledge?



Market knowledge

Section 2

2. Present your findings from your sources of marketing knowledge, and apply this practice to the business in order to ascertain what business are we in?

What business are we in?

Seventy percent of violence on weekends and in the evening/night-time period is attributed to drink (Office for National Statistics, 2015).

Evidential breath alcohol testing was introduced into Great Britain on 6 May 1983 as part of the Transport Act 1981 (Home Office, 2013)

- Safety
- Public safety
- Prevention
- Public health

The repurposing of breathalysers, traditionally used for policing drink-driving, on the doors of licensed premises, constitutes a new preventive tool within night-time governance (Boyd, Farrimond, Fleischer, 2018)

(Fortune Business Insights,
2022)

SEGMENTATION	DETAILS
By Type	• Professional • Personal
By Technology	• Fuel Cell Technology • Semiconductor Oxide Sensor Technology • Infrared Spectroscopy • Other Technologies
By Distribution Channel	• Healthcare Facilities • Law enforcement & Military • Consumers • Transport • Others (Government and Private Work Places, , Rehab Centers, Security Agencies, etc.)
By Geography	• North America (the U.S. and Canada) • Europe (U.K., Germany, France, Italy, Spain, Scandinavia, and Rest of Europe) • Asia Pacific (Japan, China, India, Australia, Southeast Asia, and Rest of Asia Pacific) • Latin America (Brazil, Mexico, and Rest of Latin America) • Middle East & Africa (South Africa, GCC, and Rest of Middle East & Africa)

Approved Breathalysers for the Uk Police force.

“The Dräger Alcotest 6820 Breathalyzers and Dräger Alcotest 7510 Breathalysers are both UK Home Office Approved devices and are used by the British police, (AlcoDigital,2023)



Section 3

3. Present your findings from your sources of marketing knowledge, and apply this practice to the business in order to ascertain what business(es) could we be in?

What about a home health hub?

Smart connected
home health hubs
using breath analysis
for virus and other
disease detection



Making paediatric
care at home
possible



Home health hub design

Normalise testing by introducing test hubs that are fun to use and designed to fit into the home environment.

Message to parents: These will protect your children and others too, through early detection and treatment of viruses and other diseases

Message to children: This will protect your parents and friends (and you will be rewarded)



Through the lens of a futurist:

Remote sensing, using a combination of wearables and in-home sensing, will maintain a constant connection between patients and clinicians, transforming the nature of their relationship and turning the current healthcare model upside down.

Brown, Steve. *The Innovation Ultimatum : How Six Strategic Technologies Will Reshape Every Business in The 2020s*, John Wiley & Sons, Incorporated, 2020. ProQuest Ebook Central, <http://ebookcentral.proquest.com/lib/trinity/detail.action?docID=6032784>.

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Health hubs protecting society

Connecting with employers

Connecting with schools

Connecting with NHS track and trace

Connecting with GPs

Linking with pharmacists for automated dispensation of prescribed medication

Preparing the way for a safer society

What have you eaten today?

Identifying vitamin deficiencies?

Child friendly design of medical devices



A top-down view of a variety of children's toys scattered on a bright blue surface. The toys include wooden train tracks with a yellow and red train, colorful alphabet blocks, geometric shapes like stars and circles, small toy cars, a red toy airplane, and various interlocking plastic blocks. The text 'Successful child focused design is aided by input from children (Stålberg, Sandberg et al. 2016)' is overlaid in white, with a semi-transparent blue circle on the left side.

Successful child focused design is aided by input from children (Stålberg, Sandberg et al. 2016)

The background of the slide is a close-up photograph of a dense field of small, five-petaled flowers. The flowers have a gradient of blue, from a deep cerulean at the edges to a pale, almost white center. Each flower has a small, dark, speckled pattern in its center. The flowers are growing on thin green stems with small, feathery green leaves. In the top left corner, there is a white, abstract, organic shape that resembles a stylized cloud or a splash of paint. It contains three small white circles of varying sizes, arranged in a vertical line.

Development of specific medical
devices (MDs) is required to
meet the healthcare needs of
children and young people

(Dimitri, Pignataro et al. 2021)

Empathy makes the difference

Empathy is the mother of invention: Emotion and cognition for creativity in the classroom (Demetriou, Nicholl 2022)

"...we argue that a very important aspect that influences invention and creativity is the empathy factor.."

Little surprise here, that empathy helps us to take ownership of a problem, by better understanding the needs of others!



Commercial drivers for focus on children

Contrary to current perceptions of limited market potential, the global paediatric healthcare market is expected to generate around USD 15,984 million by 2025 (Dimitri, Pignataro et al. 2021)

(Rahman 2021) states that NHS Test and Trace spent [£13.5 billion](#) up to April 2021

It is therefore reasonable to suppose that Governments across the globe would welcome a smart and connected Home Health Hub with virus detection and reporting capabilities using breath analysis.....but is that enough?

Or should we ask.....

Is attack the best form of defence?

Q. How might we eliminate a virus before it infects?

A. UVC LED – Talk to Columbia University Vagelos College of Physicians (Columbia University 2022)

Q. How can we proactively detect viruses?

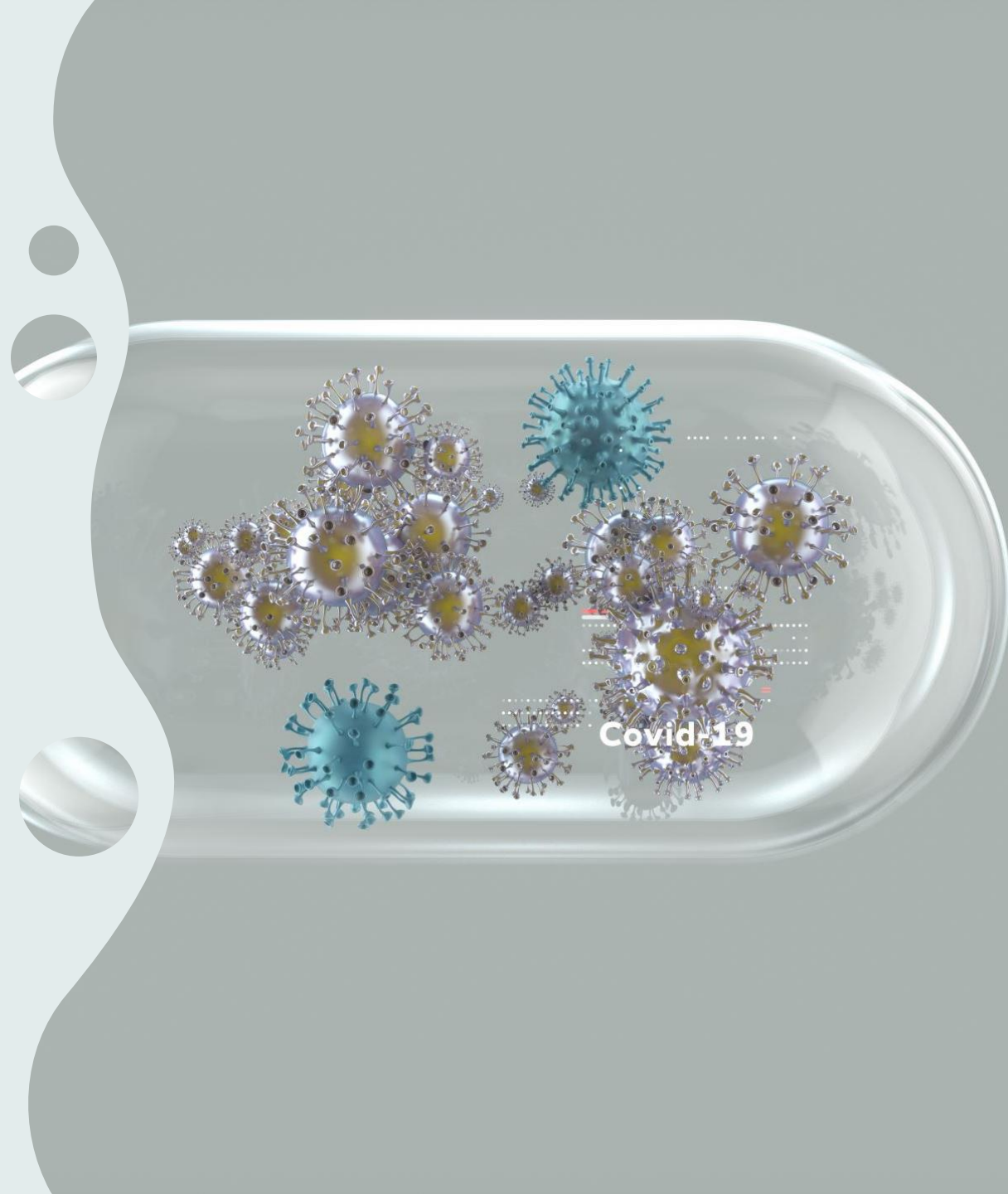
A. ELECTRONIC NOSES ON DRONES (Kaur, Kaur 2022)

Pandemic – A bigger driver!

What might be the value of pandemic control solution? The answer lies in assessing the opportunity cost of not having one!

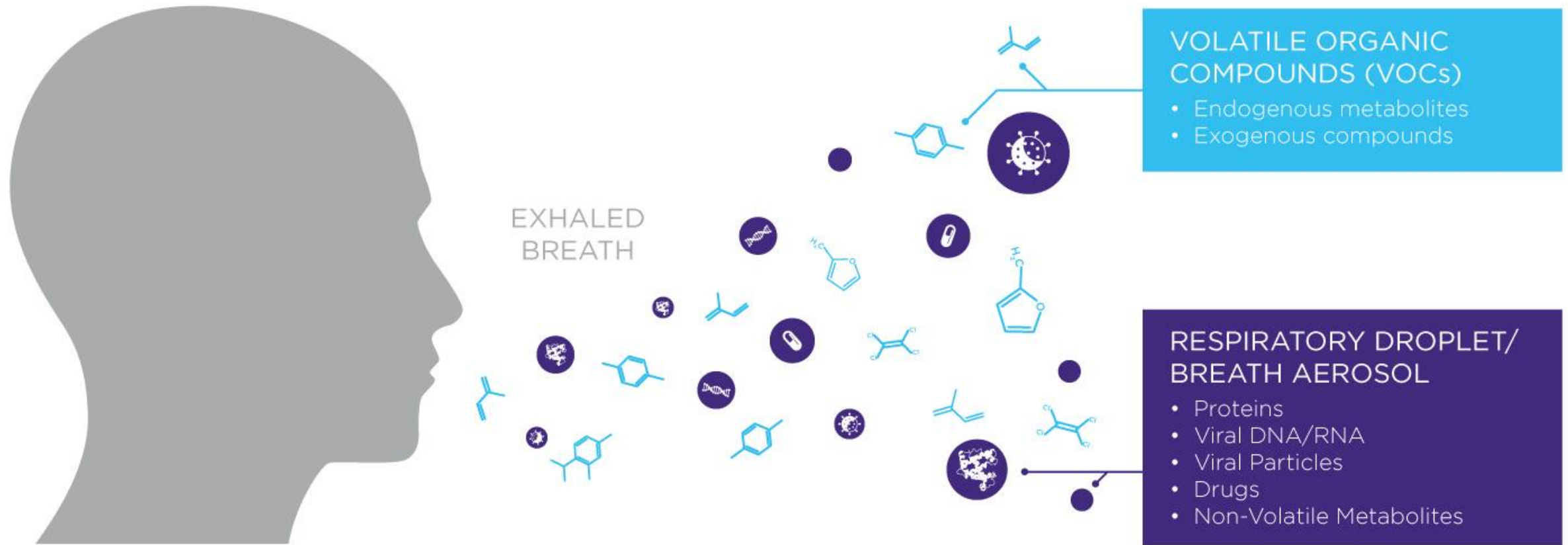
To date, the estimated costs of the global Covid-19 pandemic have reached 92.3 Trillion USD (Statista 2023)

Does anyone sense a market opportunity?



Collaboration:
Who should
we be talking
to?



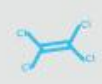
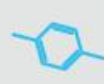


LARGE
PARTICLES



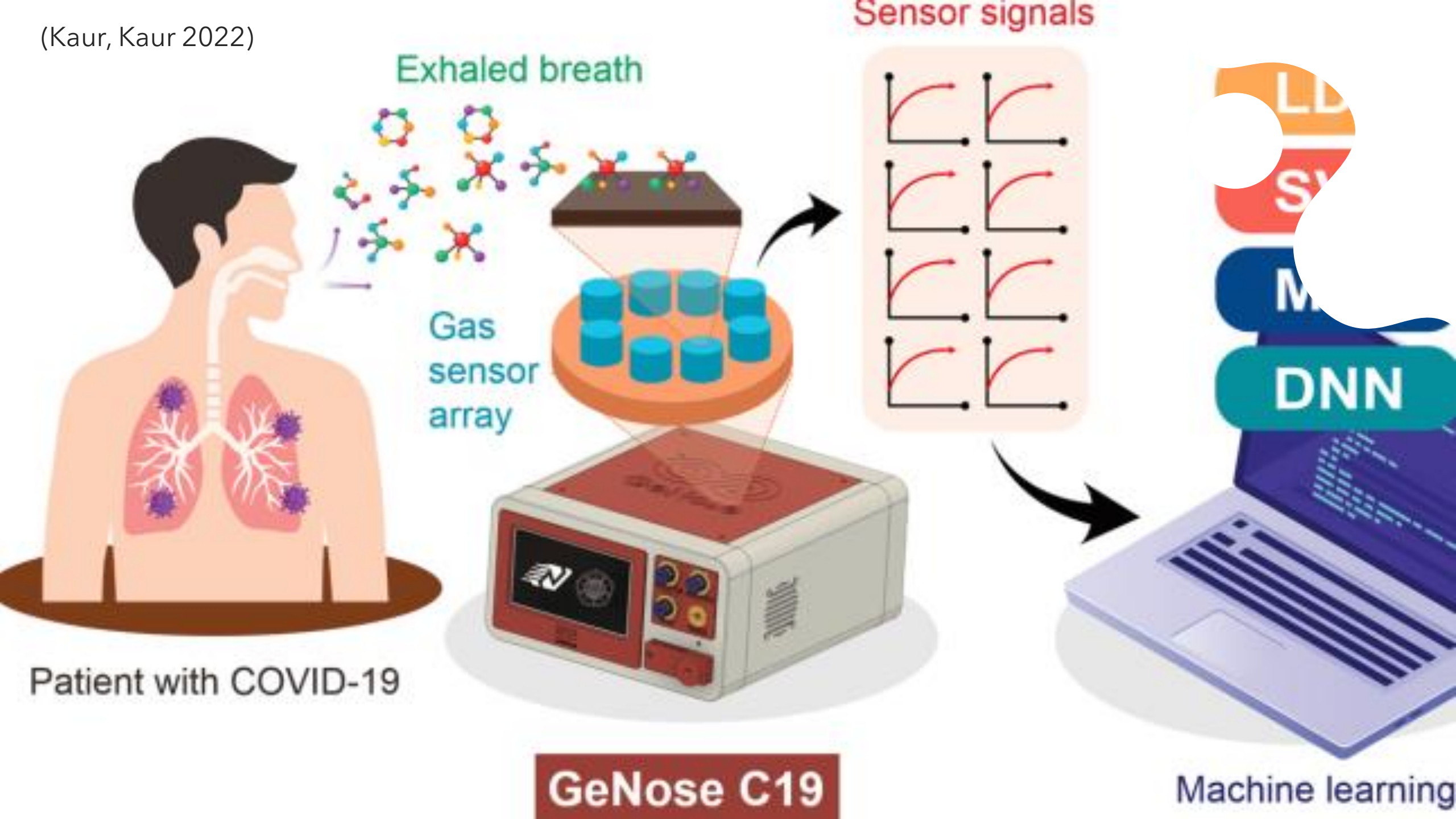
Respiratory Droplets

SMALL
PARTICLES



VOCs

(Kaur, Kaur 2022)



University Challenge – Breath Analysis Partners

Our local University KTP project is a platform for open innovation

We should therefore explore reaching out to potential project partners such as (IL-DOO KIM GROUP 2023)

Other key breath analysis technology partners might be (Owlstone Medical 2023) and (CBIRT) Centre of Bioinformatics Research & Technology (Kaur, Kaur 2022)



The background of the slide is a complex, futuristic digital pattern. It features concentric circles and rings of varying shades of blue and teal, creating a sense of depth and motion. The pattern is composed of many small, rectangular and square elements, some of which are slightly blurred, giving it a high-tech, data-driven appearance. On the left side, there are three large, white, irregular shapes that resemble stylized clouds or abstract forms. Each of these shapes has a small, solid white circle inside it, positioned near the top, middle, and bottom respectively.

Futuristic
possibilities

Airborne infrared sensors can be used to read a person's facial temperature at a distance of 100 yards or even more (Hamblen 2020)

Could these drones be used for transporting breath analysis devices?

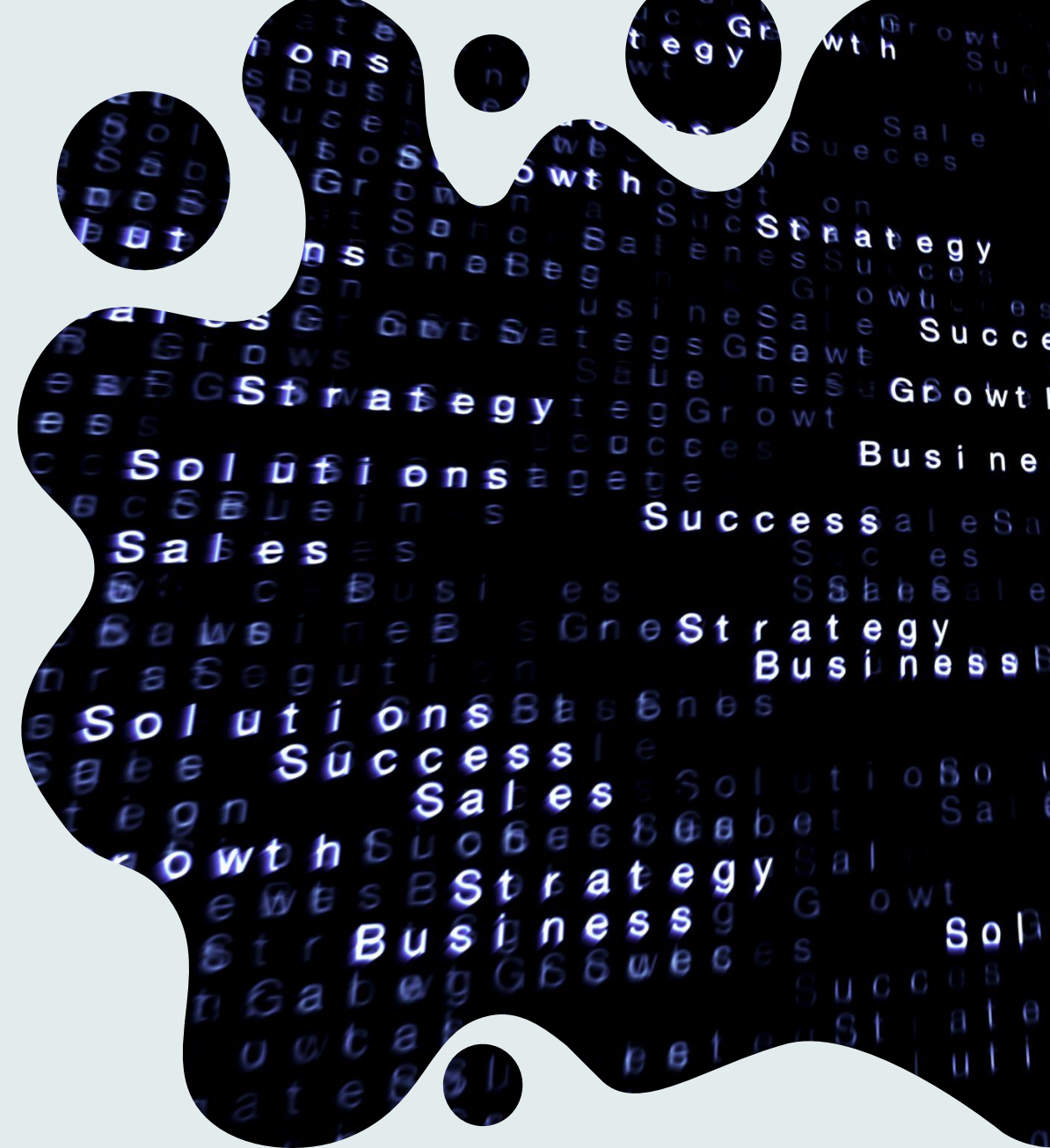
How might connected smart portable devices assist in controlling future pandemic threats?



MARKET SENSING:

Ethnographic research is needed to explore how Paediatricians, children and parents regard the Home Health Hub Concept.

This research should extend to Care Homes where hubs could become a vital frontline defence mechanism in the fight against future pandemic threats





Is there light at the end of the tunnel?

COULD IT BE FAR UVC LIGHT?

We should look closely at research undertaken by (Columbia University 2022), (Purefize 2023) and (Stanley Electric Co. 2023)

The possibilities which safe UVC LED technology can deliver should be carefully considered as part of the offensive initiative against viral infections and constitutes intelligent 'upstream thinking'

The combination of offensive and defensive weapons in the context of pandemic warfare could provide a compelling offering to both national governments and citizens

Summing
up – what
next?





Sensible+
Sensing+
Sensitivity=
Sensational

Partnerships



Candidates for collaborative partnerships include:

(Stanley Electric Co. 2023) re UVC LED

(Purefize 2023) re UVC LED

(Columbia University 2022) re UVC LED

(Goodwin 2023) re manufacturing

(Battelle Medical Devices 2023) re
manufacturing

(Acculine 2021) re Healthcare design
principles

Piercy quotes Porter and it's worth quoting!

"Operational efficiency means you're running the same race faster, but strategy is choosing to run a different race because it's the one you've set yourself up to win."¹ Superior operational efficiency may give you a short-term advantage over competitors, but then it will be copied or bettered by them. Strategy is about competitive advantage through differentiating against the customer's alternatives, continuous innovation to sustain that advantage, and organizing to achieve "fit" in maintaining the advantage. Porter clarifies again: "A company can outperform its rivals only if it can establish a difference that it can preserve. It must deliver greater value to customers or create comparable value at a lower cost or do both."²

Piercy, Nigel F.. Market-Led Strategic Change (p. 195). Taylor and Francis. Kindle Edition.

Future design – Smart & Connected

How do we make the Home Health Hub:

- ❑ Relevant (child friendly)
- ❑ Resilient (robust)
- ❑ Reusable (easy to maintain)
- ❑ Accurate (within acceptable tolerances)
- ❑ Modular (facilitating upgrades and repairs)
- ❑ Upgradeable (linked to modularity)
- ❑ Affordable (subscription based)
- ❑ Adaptable (ready for new modules)



Section 4

4. You will also include your interpretation of marketing sensing capabilities and market understanding and develop the definition(s) of value for at least one customer value proposition scenario.

Marketing Sensing Capabilities



The company has a strong marketing sensing capability that includes market research, customer feedback, competitive analysis, trend analysis, and data analytics.



The company uses these tools to gather and interpret market data and insights to inform its product development, marketing strategy, and customer engagement.



The company has a dedicated team of experts in marketing, research, and analytics who work closely with the NPD Manager to ensure that the Chemical Detector System home health hub meets the evolving needs and preferences of its target market.



Marketing Understanding



The company has a deep understanding of the health needs and concerns of parents who are looking for a comprehensive and easy-to-use health management solution for their children.



The company has conducted extensive user research to gather insights into the motivations, behaviours, and pain points of its target market.



The company has identified the key trends and drivers that are shaping the health management market, such as the COVID-19 pandemic, the rise of telehealth and digital health, and the increasing focus on preventive and proactive health management.



The company is constantly monitoring the market and gathering feedback from customers and stakeholders to ensure that its Chemical Detector System home health hub remains relevant and competitive in the fast-changing health management landscape.

Competitive Advantage



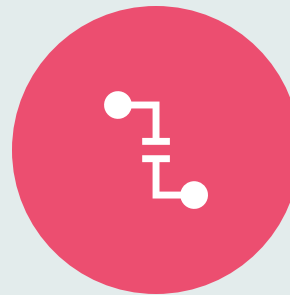
The company's marketing sensing capabilities and market understanding give it a competitive advantage in the health management market.



The company is able to identify emerging trends and customer needs and respond quickly with innovative and relevant solutions.



The company's deep understanding of the target market's pain points and preferences allows it to develop a value proposition that is tailored to their specific needs and expectations.



The company's commitment to accuracy, reliability, effectiveness, and convenience ensures that its Chemical Detector System home health hub offers a unique and differentiated solution that stands out in the crowded health management market.

Customer Value Proposition Scenario



Our Chemical Detector System home health hub provides parents with a reliable and convenient way to monitor and manage their children's health, especially during the COVID-19 pandemic.

By using advanced chemical detection technology, our hub can accurately and sensitively detect viral particles and biomarkers in breath, enabling early identification and management of infectious diseases.

Our hub also offers a range of other health monitoring and management features, such as vital signs tracking, medication reminders, symptom tracking, and personalized recommendations.

With our hub, parents can have peace of mind knowing that they have a comprehensive and reliable tool to help manage their children's health, and can connect with healthcare providers and other stakeholders when needed.

Our value proposition is based on our commitment to accuracy, reliability, effectiveness, and convenience, and our understanding of the evolving health needs and concerns of parents in the current market.

By providing a comprehensive and easy-to-use health management solution, we aim to empower parents to take control of their children's health and well-being, and to promote a culture of proactive and preventive health management.



(Sky news, 2023)

Customer Value Proposition Scenario



The Chemical Detector System (CDS) home health hub offers a unique solution for monitoring indoor air quality and promoting a healthy living environment.

With its advanced chemical detection technology, the CDS can detect and monitor a range of indoor pollutants, including volatile organic compounds (VOCs), carbon monoxide, and other harmful gases.

By providing real-time data on indoor air quality, the CDS enables homeowners and property managers to take proactive steps to improve the air quality in their homes or buildings, and to mitigate the risk of exposure to harmful pollutants.

The CDS offers features such as notifications and alerts when pollutant levels exceed safe limits, personalized recommendations for improving air quality, and the ability to track indoor air quality trends over time..

The CDS is designed for convenience and ease-of-use, making it an attractive option for homeowners and property managers who want to monitor their indoor air quality with minimal effort.

the Chemical Detector System home health hub offers a unique solution for promoting a healthy living environment by monitoring and improving indoor air quality, contributing to a healthier and more sustainable living environment.

Conclusion

- Even the finest navigation system cannot plan a journey effectively unless you input a start point and a destination, planning and management of this new product development is no different, as a company, knowing where you are is perhaps simple enough as the data is apparent, knowing where you could be is what makes development and innovation worthwhile but knowing where you are going and how you get there with the least commercial risk and to the greatest advantage to both you and your customer is the real key. In the words of Frank Eliason, Global Director, Citi *"Truly listening is hearing the needs of the customer, understanding those needs and making sure the company recognizes the opportunities they present."*
- The home health hub presents the opportunity for the public to take more control of their own health. In addition to this it could prevent a wide spread of illnesses. Although the breathalyser cannot replace a doctor, it can be a first step for individuals to take control of their own health and to look after one another. The more people that take part and use the home health hub the more data can be gathered to not only improve the product itself but to gather data on the illness itself.
- Market sensing with a focus on ethnography, futurology, and a deep understanding of the drivers and enablers for a home health hub solution will be essential for the success of the concept. Smart connected hubs designed with modularity in mind will facilitate the integration of future sensor technology. Big data analysis will be catalysed as more users of the hubs share data allowing the results from breath analysis patterns/changes to be detected. This project demands involvement, partnering and the 'buy-in' of all key stakeholders. The potential benefits are breath-taking :)
- The home health hub offers a comprehensive health management solution with a range of features that help identify health issues early, manage chronic conditions, monitor vital signs, and connect with healthcare providers and other stakeholders. The value proposition emphasizes the focus on accuracy, reliability, and effectiveness, providing peace of mind for parents and promoting healthy living environments for families and communities.



Research

Further research suggestions:

- ❑ (Nurputra, Kusumaatmaja et al. 2022)
- ❑ (Li, Wang et al. 2021)
- ❑ (Wang, Zhang et al. 2020)
- ❑ (Kaloumenou, Skotadis et al. 2022)
- ❑ (Nidheesh, Mohapatra et al. 2022)
- ❑ (Haworth, Pitcher et al. 2022)

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