DESIGN-LED TESTING
A PRIMER

INTRODUCTION

Giving transformational ideas a chance to succeed through objective market-based prototyping and testing

What is Design-led prototyping?

Prototyping and testing is the process of conducting research around an early sample, model or release of a product to test it as a concept *in situ*. This process is used to evaluate and iterate a new concept to support continued, incremental improvement before it is launched into markets.

Working from the insights generated during the research, building out a prototype is a way to translate a raw idea into something which is real, tangible and interactive. A prototype helps designers communicate an idea to consumers, and to test whether that idea will reach the desired outcome (I.e. deliver on a consumer need). Moreover, translating an idea into reality positions that idea for critique, for refinement.

Design-led prototyping is an iterative process, meaning that critique and refinement comes through a series of validation exercises wherein we present the prototype to consumers and solicit their feedback. Testing does not entail asking users what they think about the prototype as much as it anchors a broader conversation with consumers about how the central idea of the prototype might add value in their lives. We prompt consumers to consider how it might function in their day-to-day lives, what advantages or efficiencies it might bring, how it might be improved upon or what vulnerabilities it might have. Consumer feedback is a critical part of not only refining a potential solution but also promoting a sense of investment and ownership from the community over the potential solution.

Why do we need design-led prototyping??

Employing testing and prototyping, as part of the research and design process, leads to:

- Final products, services or solutions that are de-risked from the outset and are more likely to be accepted in markets on launch

- Data that is more reliable because it was collected in-situ and overcomes some of the challenges faced around social biases that other forms of research and design face (particularly in collectivist societies)

- Iterative development of final solutions (moving from low-fidelity to high fidelity) and incremental investment requirements mean that changes can be made quickly, and high-fidelity solutions are pre-tested before investment

- True innovation and disruptive change that shapes markets and has the potential to transform the lives of consumers

INTRODUCTION CONTINUED

ThinkPlace is a global design and innovation firm who integrates both human-centred design and systems thinking approaches to provide a deeper, richer understanding of the behavioural determinants affecting people's capability to confidently, willing and effectively change. That change may come in the form of a social norm or harmful behaviour, or it can come in the form of decision-making around a product or service.

By taking an approach that's simultaneously human-centred and systems-oriented, we look to empathise with the lived experience of a problem or challenge space and leverage that into system-level interventions that have the most potential for bridging the gap between intention and action.

This learning module is part of a set of tools and resources generated under the Bill & Melinda Gates Foundation's Private Sector Partnerships (PSP) for nutrition initiative. The PSP initiative funded a portfolio of demonstration projects as part of a learning agenda on how to overcome barriers that have impeded private companies from making nutritious, packaged fortified foods accessible and affordable to lower-income consumers in low- and middle-income countries (LMICs).

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WHY TRANSFORMATIONAL CONCEPTS DIE

Great ideas rarely start beautiful. The dull spark of any new idea needs to be protected in its infancy and given time to be prodded, tested, and improved. Often programs or initiatives to develop new product or service innovations set out with the intent to create some form of transformational or disruptive change. It is common for these programs to start out with an ambitious intent that, over time, becomes more conservative and subject to compromises. The original intent becomes diluted, and the final outcomes fall short of the desired disruptive change.

In any transformational program, there exists a natural tension between a desire for radical ideas and the unfamiliarity of the territory that we must wade in to find them. For program managers, this unknown can feel risky. If the experience of participants in the program is not intentionally managed, the radical ideas that an innovation program is built on may never be given the space and opportunity to succeed.

Co-design is one of the most effect methods for that intentional management of an idea as it develops. Co-design brings all voices to the table not just when their expertise is most relevant, but for all stages of idea development. This includes active involvement of the users who will be affected by the program outcomes. However, when done poorly, co-design can lead to conservative or 'lowest common denominator' ideas that assuage the subjective concerns of the participants but lose sight of bigger possibilities. This is because in a group setting, subjective opinions are amplified and can easily overshadow or discredit objective and naïve hypotheses about an innovation.

Early prototypes of a transportable self-covering toilet seat for desert areas. Not winning any design awards at this stage of development.

WHEN PROTOTYPING & TESETING IS NEEDED

While design-led prototyping in the field can provide value in a wide range of contexts, there are several key scenarios in which it has the most potential to create significant and transformational impact. These include:

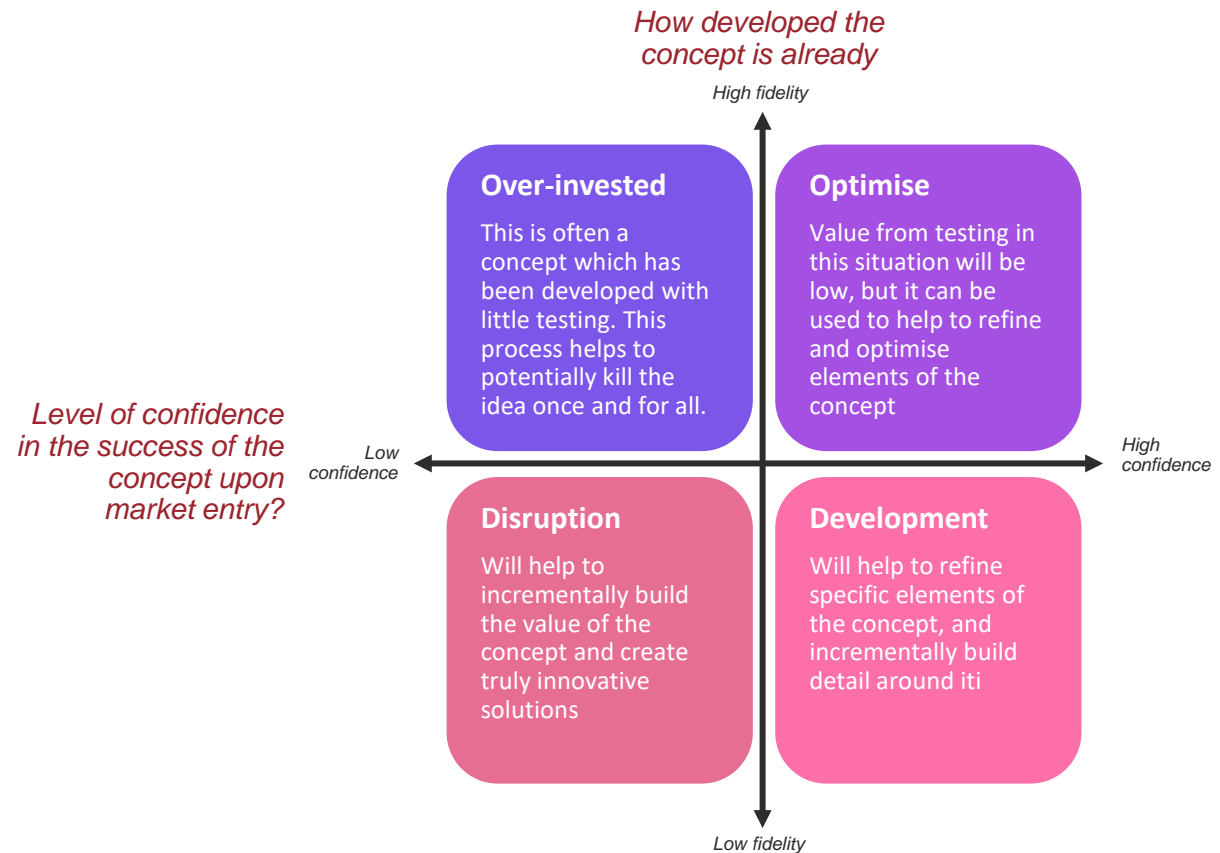| **1** Where you have uncertainty around the future demand for a product, service or brand.	**2** When high-potential, but high-risk ideas aren't being given a chance to succeed.	**3** When you want to rapidly develop a concept (brand, product or other) but want to manage the risk of getting it wrong.
If you are developing a new, potentially transformative product, service or brand, this process can be critical in getting an objective and unbiased understanding of the potential future demand and interest for that new innovation.	In many cases, high-potential ideas are never developed due to the commensurate risk they pose to the company or brand. Design-led field prototyping emphasises scrappy, early learning in order to progress an idea – and therefore provides a very low-risk context in which to do so.	Because the testing process is iterative and progresses from lower fidelity (raw, unfinished) to higher fidelity (polished, market-ready) prototypes, it can be a powerful way to rapidly and iteratively validate a solution without sinking a lot of costs, consuming a lot of time or taking on a significant amount of risk. This process often helps you identify the hidden challenges or risks within a certain idea.

KEY PRINCIPLES AND FEATURES

There are several key features and guiding principles of design-led field testing that make it distinct from other forms of research and prototyping. These are:

- The process of testing **relies on a balanced portfolio approach,** meaning there is scope to explore high-risk and high-potential concepts with just as much energy and investment as lower-risk solutions likely to produce incremental change.

- The process of testing is **market-based**, meaning that it occurs in actual usage contexts with real consumers. Understanding the environments around concepts helps us to understand cultural nuance around usage scenarios and the impact of variables.

- The process of testing is **iterative.** If something is not working, if something isn't working we test it to understand why and respond accordingly

- The process of testing is **informal and semi-structured.** This makes it flexible, and able to respond to changing circumstances and dynamic environments

- The process and results of testing **improve confidence in the market success of a concept.** It de-risks investment through objective measures that are as close to the real environment as possible

How can design-led prototyping be used in practice?

How developed the concept is already

High fidelity

Level of confidence in the success of the concept upon market entry?

Low confidence   *High confidence*

Over-invested

This is often a concept which has been developed with little testing. This process helps to potentially kill the idea once and for all.

Optimise

Value from testing in this situation will be low, but it can be used to help to refine and optimise elements of the concept

Disruption

Will help to incrementally build the value of the concept and create truly innovative solutions

Development

Will help to refine specific elements of the concept, and incrementally build detail around iti

Low fidelity

WHEN SHOULD YOU USE DESIGN-LED PROTOTYPING?

What sort of business development challenges does this approach help to solve?

- Testing components or systems in markets helps to **resolve disagreement in the design team** about which elements are most likely to be successful

- The process helps to **simplify multivariate products or services**, because it allows us to break down systems into components and understand how they behave independently and together

- It helps to support **a product development focus** while considering the environment and systems of influence in which a product will ultimately be in a market

What doesn't is help with?

- Situations where you have high confidence in the outcome, and the risk associated with launching a product into the market is low

- When the strategy around the product or service is unclear or not completely set

- Testing a product or in an environment that creates significant risk of has the potential to cause harm

- When there is no scope for change

A testing and prototyping approach works best for project that have the following features:

Potential returns are high and the introduction of the concept into the market is likely to be disruptive. This means projected returns are either:

- **Evolutionary**, meaning that they are likely to cause accumulating but significant change to existing products, services or systems. For example: introducing a new product category into a market, that has the potential to create demand for complementary products

- **Transformational**, meaning they have the potential to fundamentally and completely change structures and systems. For example, creating a new way to make, distribute, and sell products that would lead to entirely new markets and businesses with significant competitive advantage

Potential risk is higher, which can be due to:

- The projected potential returns, which would create significant change

- The amount of investment required to design and develop the concept is high

- The concept is complex and has a lot of variable components, or will exist in a highly dynamic, unpredictable environment

- There are challenges in understanding consumer behaviour, and traditional methods of research are not working

Potential risk / Potential returns chart showing Core, Evolutionary, and Transformational curves with pink circle labeled "Where this process is most useful"

Core solutions can be derived through routine data collection & analysis

Evolutionary solutions can be derived through abductive thinking, sensing and insight generation.

Transformational solutions can be derived by scanning for megatrends, behavioural drivers, and more.

HOW CONSUMER BIAS IMPACTS TESTING

Collectivist vs individualist audiences, and their impact on testing

Collectivist societies are societies in which the needs and group goals drive decisions, norms and behaviours. In an individualist society, individuals set personal goals and objectives, based on self need. This is important to understand as a majority of the target areas for private sector food fortification programming are collectivist. To see which countries are collectivist or individualist, see the Hofstede Insights tool (Link).

Often, testing processes that engage potential future consumers are based on traditional testing and research approaches (for example: surveys, questionnaires). Because these approaches have been designed within individualistic societies they yield successful and robust results. However, we have found that they can have adverse and misleading outcomes when applied in collectivist societies.

Design-led field testing is designed to give objective understanding about the true demand and appeal of innovations designed for collectivist societies. We provide accurate and robust results that give true indicators of behaviour in these situations.

	Collectivist	Individualist
Comprehension and understanding	Is unlikely to seek clarification and will respond with acquiescence	Will likely question or interrogate the question to understand the purpose behind it
Referral to context	Will likely refer to the context based on external factors and context factors	Will likely connect to the context based on internal memories
Extremity of response	Will bias towards neutral and non-offensive responses	Will look to have more contradictory and extreme responses
Bias of answer	Answer will be biased by perceived social desirability	Answer will be biased by individual desirability

HOW CONSUMER BIAS IMPACTS TESTING

How do we achieve objective results through design-led prototyping in the field?

	Survey based indicators of demand	**Incentivized** recruitment	Asking about an **intangible** concept	**High volume, low objectivity** results
From	Typical processes to test ideas will engage future customers in a survey or research type activity. This brings in many biases.	Incentivising participants beforehand brings in biases, whereby participants might want to add as much value as they can, which typically skews towards affirmative answers.	Other testing methods engage users verbally or in a written format to ask about their response to that stimuli.	A typical study would ask about levels of interest in a new concept, and would look for a high number of participants, across many locations. As previously discussed however, the results are very subjective.
	Market based indicators of demand	**Non-incentivized** recruitment	Testing a **tangible** (prototyped) concept	**Lower volume, more meaningful** results
To	A market-based approach situates the test in the typical setting (for instance, a local marketplace) and the consumers aren't curated.	Often programs or initiatives to develop new product or service innovations set out with the intent to create some form of transformational or disruptive change.	The concept (product, idea, sales channel, brand, etc) is created and prototyped, meaning they are responding to a more tangible artefact, giving more objectivity.	This testing method may see lower volumes of participants, however the data we get is more objective and therefore more valuable.

STAGES OF DESIGN-LED FIELD PROTOTYPING

Due to the nature of this type of work, there exact activities in testing will vary. However, there are some key stages of Design-led field prototyping have been described below. As we move through the process, both our thinking and the physical prototypes become more developed. The end of one of these processes also often the start of another, as prototypes move into higher levels of fidelity and designs become finalised.

1 Identify hypotheses and assumptions

Using existing information to develop ideas and hypotheses about the concept and how it might behave in the market
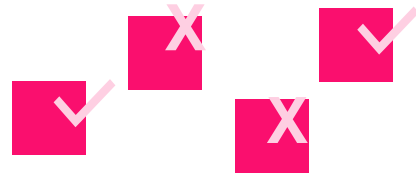
2 Identify and validate components

Break the concept down into component parts and determine how each one will be tested to prove/disprove hypotheses

3 Build and test

Build prototypes and examine how they behave in situ under various conditions
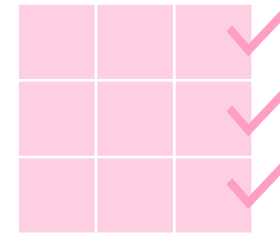
4 Measure and iterate

Measure the impact of activities, understand what worked and what did not, and determine how the concept might be made more effective. Continue developing the concept and form more hypotheses about improvements to the concept

IDENTIFY HYPOTHESES AND ASSUMPTIONS

Disassemble your ideas

Ideas can be disassembled into hypotheses and assumptions about why we think they will (or won't) work. A hypothesis consists of a simple statement with three parts:

If we *[do something]* for *[target audience]*, they will *[respond in a certain way]*.

Assumptions underpin these hypothesis, which provide reasons why we expect a specific outcome to be achieved as a result of the product, service or intervention – for example, people in this community do not have disposable income to spend on [our new product]. For each test, we form a series of these hypotheses and ways that we will measure them that guide our testing activities. For example: we might assume that the cost of a product has to be below a certain amount based on secondary research, but test price sensitivity amongst the specific target group alongside a well communicated value proposition to validate it by incrementally increasing the price while measuring and comparing sales data.

Although our hypotheses and assumptions may be accurate – perhaps they are based on extensive knowledge of the subject matter or personal lived experience – it is important to objectively prove or disprove these statements with end users. This can be done through rapid and inexpensive engagements prior to beginning any prototyping activities.

Further, depending on the level of risk associated with a specific hypotheses, we might validate and pre-test specific elements so they can remain consistent throughout and avoid unnecessary investment. For example, we might pre-test the desirability of various product flavours before purchasing larger quantities of them for the purpose of large-scale testing.

Cut through the fog

During concept development, in designing your tests, and in interpreting results all parties must hold each other honest and accountable to the observable & objective **Facts,** what our **O**pinions are (even when they feel like facts to us), and what our **G**uesses are about what may happen

What are the **facts?**

What are our **opinions?**

What are our **guesses?**
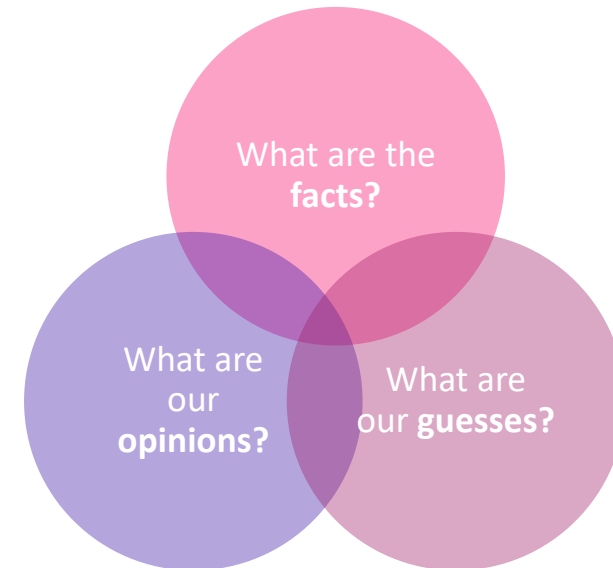
IDENTIFY COMPONENTS

The objective of testing an idea or prototype is to determine which parts of the concept work and which do not work. A key part of this process is to determine the scope for change and parameters about what is being designed. For example, are we designing the product? The delivery method? The marketing strategy?

To do this, we look at the daily journeys of our target consumers, and the potential touchpoints that they will have with the testing scenario over a given period of time. These journeys are crucial to help determine at which points a potential consumer will experience a need or want that the product, service or system could fill. From this, we develop a Theory of Change model which describes:

- **What is currently happening**, from the perspective of key stakeholders and the system as a whole

- The **desired future state** for each of the stakeholders and the system as a whole

- **How the product, service or system will support the shift** from the current to desired future states

The Theory of Change also helps to frame the measurement and evaluation processes that underpin testing.

Breaking an idea down into core components, and considering them separately, allows us to do this without testing every detail of the idea at once. It is possible and likely that some components of the idea are more significant and may need to be tested more thoroughly, while others remain static.

Components can be broken down across many dimensions and should, at least, consider:

- **Elements of the prototype itself**: most prototypes have multiple 'pieces' that make them work. For example, a new food product consists of taste, smell, colour, packaging, texture, cost etc. You may want to test these elements in one integrated prototype, or individually.

- **Experience**: what is the setting that the prototype is tested within? Is the success of the test contingent on making sure the location, people involved, and access to the test impacting how the user interprets the prototype? Note: your testing methodology should be well thought through to ensure the testing its self is not overly influencing how the prototype is received (for example, the presence of foreign researchers).

- **Context**: As with experience, you may or may not be able to test different components based on where and when you are conducting the test. Food samples during Ramadan is probably not a good idea, but you may be able to test brand concepts.

- **Fidelity**: The questions you are asking must be suitable to the fidelity of the prototype. If you are testing enjoyment of a novel boardgame, the quality of manufacturing may not be integral. Conversely, if you are testing whether a participant *would buy* that boardgame the packaging may need to be much higher fidelity.

BUILD

Once components have been identified, they have to be created for testing. The fidelity of your prototype to be tested should reflect the level of confidence in the idea, and the amount that you are willing to invest in it.

- **Low fidelity prototypes** are a fast and rough representation of the minimum viable version of the idea. Because these prototypes are inexpensive, they are a low-risk way to begin testing a radical or innovative idea. Low fidelity helps us to understand aspects of the idea in broad strokes: is there immediate demand for this product, service or initiative? Is the business landscape supportive?

- **Medium fidelity prototypes** begin to mimic the final solution more closely and seek to test finer details of the idea. They are more complex and have more components, and start to unpack more detail around the idea: how might this idea work in the market? How might consumers interact with it in their day to day lives?

- **High fidelity prototypes** are similar to small-scale trials of the final solution, where more time and resources are invested to closely simulate real-world market conditions. These prototypes are as close to the final product as possible, and represent the entire system that will surround the final solution: how might this be sustained in a market? How does this product interact with others that are currently in the market?

A mix of fidelities can be used in any one test. Regardless of fidelity, it is essential that what is being tested is still desirable to interact with.

TEST

Testing plans

It is important to have a clear testing plan to ensure the objectives of the market-based prototyping are achieved. The plan should consider:

- **Where** you are testing, and what the potential impacts of a specific location might be on results. Location should be representative of where the final product will be sold, and a range of locations should be tested if there is variety in target consumer or usage occasion

- **When** you are testing, which should respond to the daily routines of consumers and the usage scenarios that are being targeted

- **How long** the testing phase, and the individual tests, will run for. It is important to balance collecting enough information to inform decision making with remaining flexible and adaptable to test variations and alternatives

Testing plans should clearly prescribe the goals and desired outcomes of the test, but leave enough flexibility to respond to emerging findings and potential exploration.

Testing plans should also consider optimal moments for stakeholders to view tests, review data, and contribute to ongoing thinking. This not only creates an opportunity for stakeholders to understand the context in which a product is sold, but also gives the team an opportunity to infuse new expert thinking and perspectives into tests.

Testing activities and tools

By and large, the tools and techniques for testing will be driven by the nature of the prototype. Specific testing activities depend on the outcomes you are seeking. Some examples include:

- A **testing plan** can be a great, concise way to capture what you are testing, when, with what consumer groups, and in what situation, context or locale. A testing plan should also include what artefacts you need and what enablers are necessary to test them. For example, if you are testing a video-based prototype consider: how to I 'set the stage' for displaying this video? How will the quality of production impact the element I am testing? How does the 'viewing experience' (e.g. indoor/outdoor, communal/individual) impact the element I am testing?

- **Tracking tools** are a necessary component of testing for prototypes where you may need to understand changes over time (longitudinal). They are usually tailored to the specific prototype, but usually comes in the form of a simple spreadsheet (which logs deployment and daily or weekly changes). The field team engaged in the testing inputs into the tracker regularly.

- **Master tracker** is usually used to provide an overview of all prototypes actively being tested. The tracker captures which prototypes have been discontinued due to poor performance, which have been merged and which have been refined and re-tested. Having this singular record supports the team's decision-making in between each iteration.

- **Prototype Scorecard** is a useful way to standardise the way you assess prototype performance. One scorecard is usually designed (with relevant indicators, e.g. Elements of desirability, feasibility, scalability) for a range of prototypes, and is updated after every iteration.

- **Behavioural design canvas** is a tool used during the testing of *behavioural* interventions. It holds the prototype accountable to achieving a specific behavioural outcome via a specific tactic.

TEST EXAMPLE TOOLS

An example of a simple testing plan.

Example Behavioural Design Canvas.

Excerpts from the ThinkPlace's scorecard indicator bank (above) and an example scorecard assessing desirability (left).

MEASUREMENT AND REPORTING

Tracking and measurement

There are a range of ways in which field tests can be tracked and measured. This process involves breaking down activities into two categories:

- Activities that are set up and monitored without change over the testing period. The measures associated with this type of activity could be quantitative and may be captured passively through routine data collection.

- Elements that are deployed and then continuously prototyped, changed, and actively improved in response to stimuli. Measurement around these elements varies, and is often taken for shorter periods of time

Each variable being tested can fall into both of these categories during a test, but this should be made clear in the testing plan. Having too many variable elements will mean that the cause of change will be hard to determine, but having too many static elements will lead to missed opportunities for improvement. The testing plan describes and accounts for these, and creates a balance between the two that is appropriate for the desired outcomes, context, and time period.

A summary of metrics which were measured for a project exploring bulk vending of porridge. The last image is a presentation of complimentary products being requested by consumers.

MAKE SENSE AND ITERATE

A key advantage of this approach to market-based testing is the flexibility afforded to the design team. If it is clear that something is not working, or there is an obvious improvement that can be made within days (or hours) of launching the test, why not address the revision and re-launch as soon as possible? Through this iterative process, the product or initiative can be rapidly refined, meaning the testing duration can be more targeted and efficient.

The iterative testing process cycles through four stages:

- **Learn** – Analysing and understanding the data we have collected through our test(s). Did we achieve what we set out to learn about each component our product or service?

- **Plan** – If we have not achieved our original objectives, determining what changes need to be made either to the testing environment or the product itself.

- **Build** – Making revisions to the approach or product as necessary

- **Test** – Re-launching or re-mobilising with the new revisions.

When the testing objectives have been achieved, a decision needs to be made to progress the idea to a higher fidelity or longer-term trial, begin implementation planning, or to discontinue development.

Decision Point

Test

Learn

Build

Plan
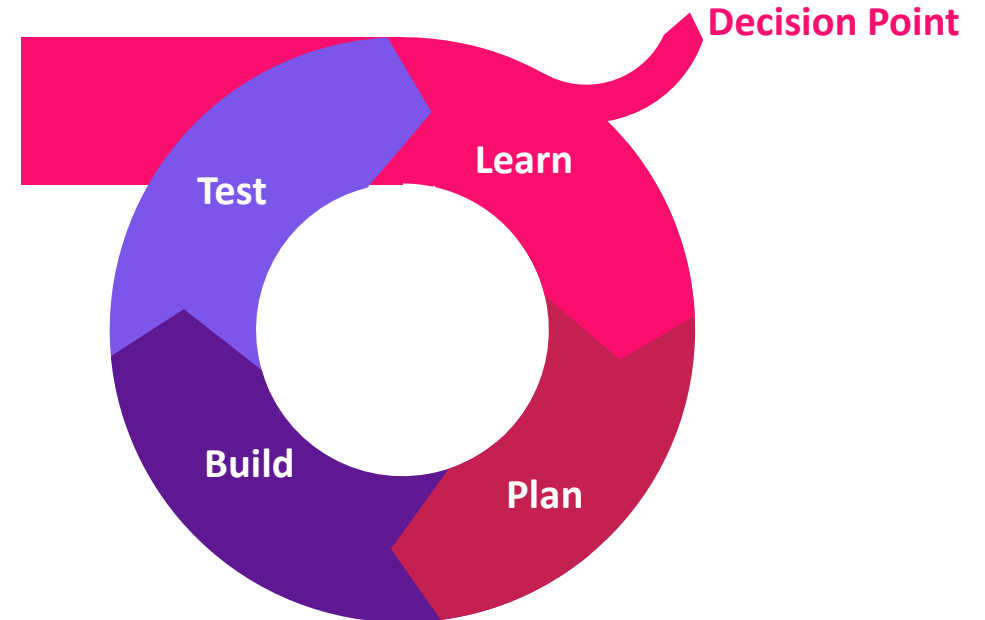
EXAMPLES IN PRACTICE

Case study – Fanmilk Nigeria

This process was used to guide the design of the product value proposition, product format and flavour, positioning and key messages. The process went from very low fidelity prototypes, through to a final concept which is now in market.

- **Sprint 1 –** 6 vastly different product packages were developed to test the broad positioning and value proposition.

- **Sprint 2 –** Was refined down to 3 concepts, which started to bring together the positioning, packaging and flavor elements.

- **Sprint 3 –** tested to products, which were 'market ready'. This test tested the product, flavor, positioning, packaging and also the sales channels.

At the completion of each testing phase, data was analysed to look at which concept performed better, and then a co-design session was run to iterate the concepts based on this objective data and insight. This process helped to make critical decisions around the product, positioning, packaging, price and also the desired sales channel.

Sprint 1
1 week

The first concepts were mocked up and tested in the field with the target audience, to get their initial thoughts and rankings.

Sprint 2
1 week

The second round was tested through fake sales activations. Sales people walked the streets, and counted every time a customer requested the product.

Sprint 3
12 weeks

The third sprint was a scaled out market test in 2 regions. (this was conducted by the private sector partner)

Sprint 4
Ongoing

WHAT HAPPENS NEXT?

Design-led prototyping and testing drives iterative decision making, that can lead to a range of outcomes or next steps. Regardless of outcome, consumer-led field testing supports more robust decision making and provides clarity around how concepts will operate in real world situations. These can be decisions around:

- **Further consumer-led field testing or design work.** The process of testing is iterative, and the process or proving/disproving hypotheses can lead to the creation of new hypotheses. The results of testing could require changes to the concept (that could then be tested), or lead to the creation of higher fidelity prototypes.

- **Further design work.** Given the complexity in which most products and services operate in, there may be need for further design work to understand the system that will operate around a concept.

- **Business case development.** Consumer-led field testing provides a solid foundation for the development of decision-ready business cases.

- **Market testing.** Testing can provide certainty around concepts which can de-risk the market testing activities. The flexibility of consumer-led field testing can provide more certainty around the variables to be implemented and measured in a full-scale market test.

- **Concept launch.** If testing provides a high level of certainty around how the product is likely to behave, results can be used to de-risk fully launching it into the market.

END