If a picture is worth 1,000 words, a prototype is worth 1,000 meetings.[1] Why prototyping will help you get better results.

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The goal of intervention design is to deliver services that are wanted, that work and that will scale. If people do not need what you are delivering or don't respond in the way you expect, then your intervention will fail. If you are not delivering the change that is expected by government, then your intervention is wasting public money. If your intervention can't practically be delivered or scaled up, then it is not delivering public value.

In a climate of constrained public spending, getting better at intervention and policy design is critical. The economic climate is unlikely to improve in the short term and if we are to deliver better services then we need to tap into our collective wisdom and improve how we work.

The MoJ has just published its first 'Evaluation and Prototyping Strategy'[3] with a simple message: better evidence enables better decision-making which delivers better outcomes. To deliver at pace, we need to build learning more effectively into what we do. We often start with the assumption that a new intervention is better than 'business as usual' but this often isn't the case. For example, in the world of medicine, even among the most promising new drugs for cancer, only 4 in 10 are found to improve outcomes.[4] Building in effective learning so we can stop things that don't work is essential for delivering value for money. And even the 'best' idea won't work straight away in complex and chaotic environments, so we need to purposefully build in learning loops to refine and optimise any intervention.

Prototyping is a way of developing, testing, and improving ideas at an early stage which is low cost and low risk.[5] It comes before traditional piloting or evaluation and, whilst it hasn't been used routinely in justice settings, it is a methodology which has been extensively utilised in engineering, product development, and digital service design. For example, Government Digital Service mandates the use of an agile approach to build and run government digital services.[6] Agile delivery has five stages: discovery, alpha, beta, live, retirement. Prototyping is like discovery and alpha whereas evaluation happens during the equivalent beta and live stages.

In addition to digital services, prototyping is also increasingly being used by governments around the world in the development of public services.[7] [8] Prototyping places greater emphasis on the quick, iterative testing of ideas to generate insight and to use this learning to inform intervention development at an early stage.

This article sets out why prototyping gets better results and provides a framework for how to embed prototyping in your work. Prototyping is an early first step in developing evidence-based policy that will deliver better justice outcomes. If it is done well, prototyping means that your intervention will be refined and optimised prior to more robust evaluation.

1. Quote from Tom and David Kelley, Founders of IDEO
2. If you need more information or want to talk about anything that is included in this article, please contact me at EvaluationPrototypingHub@justice.gov.uk
3. MOJ Evaluation and Prototyping Strategy - GOV.UK (www.gov.uk)
4. Djulbegovic, B., Kuma, A., Soares, H., Hozo, I., Bepler, G., Clarke, M., & Bennett, C. (2008). Treatment success in cancer: new cancer treatment successes identified in phase 3 randomised controlled trials conducted by the National Cancer Institute. *Arch Intern Med, 168*, 632-42.
5. Nesta (2011). Prototyping Public Services: An introduction to using prototyping in the development of public services.
6. https://www.gov.uk/service-manual/agile-delivery
7. McGann, M., Blomkamp. E., & Lewis, J. (2018). The rise of public sector innovation labs: experiments in design thinking for policy. *Policy Sciences,* 51, 249-267.
8. Mintrom, M., & Luejens, J. (2016). Design Thinking in Policymaking Processes: Opportunities and Challenges. *Australian Journal of Public Administration, 75*, 391-402.

Prototyping will get you better results

Reason 1: Those close to the problem are closer to the solution

In the 1980s there was a TV programme called 'Back to the Floor'. Owners of failing businesses would spend a few days on the front-line in different parts of their business. Every week it was a different context but with the same underlying problem. A disconnect between what the people in 'the back office' thought was happening and what was happening on the front line. Similarly, a review of government 'blunders' identified operational disconnect between those developing policy and those impacted by it as one of the primary causes.[9]

The further away you are from a problem, the easier it is to fall into the trap of thinking a problem is easier to solve than it really is. As H L Mencken said, "There is always a well-known solution to every human problem – neat, plausible and wrong".[10] The people who know the most about any problem are the people facing it – staff on the front line and service users. But these people often have the least power, influence, and opportunity to change it.

Prototyping changes this power imbalance by making operators and users of a proposed intervention an essential stakeholder. Ideally, they should be central to understanding the problem and co-creating potential solutions. At the very least, their feedback should be sought at the earliest stage to understand if they 'love it', want to 'change it' or think we should 'bin it'.

Reason 2: It prioritises quickly testing and refining your idea in context prior to evaluation

Innovation is critical to tackle social issues; it is central to the process of development. In traditional evaluation, interventions or policies are often designed in isolation and then implemented. The intervention is fixed and does not 'accept' mid-course corrections for the period of the evaluation. Prototyping moves away from this linear mindset and instead approaches design as an iterative, adaptive process.

At its core prototyping accepts that no solution will be designed perfectly at the outset and that for a policy or intervention to achieve its outcomes it is essential to understand the context in which it is delivered. You'll learn more by testing in context than by sitting around a table listening to 'once removed' opinions to design your intervention.

The sooner people who understand the context can interact with the potential solution the better. It is very difficult for people to interact with abstract ideas that they cannot 'see'. At the beginning a prototype is a basic, inexpensive, and visual representation of a potential solution. This could be a visual pathway, a storyboard, or a mock up video. It forces you to think through how the prototype will deliver change and then test with key stakeholders on the ground who would be involved in delivering it. This may help you to identify critical assumptions and will enable you to refine your prototype to fix obvious flaws. You can also start to understand if there is demand for your intended solution.

At this stage, the feedback is still opinion and some things we can't find out until we give them a go. So, the next step is to test part or all of your prototype in situ to understand what happens during implementation. The focus is on learning why things happen and to refine and optimise your idea as you go. This allows you to quickly change your focus as you spot design flaws that can be costly, even in small scale pilots. You can also test your riskiest assumptions to see if they hold, because if they don't, then you will not achieve the impact you intend.

This approach helps you to see what happens in practice and assumptions that you might need to evaluate on a larger scale. It can also help to build confidence, momentum, and interest in an idea with staff and users.

Reason 3: Prototyping is a framework to build a lasting learning culture

Whilst the evidence on how to change organisational culture is in its infancy and needs development, there are several themes of practice or approaches within the literature that may be useful or are plausible in driving organisational change.[11] These include: to be explicit about the nature of the problem, to consider the existing evidence we have on what works, to include people who experience the problem, to have a clear rationale about how the proposed

9. King, A., & Crewe, I. (2014). *The Blunders of our Governments.* Oneworld Publications.
10. Mencken, H. L. (1920). *Prejudices:* Second Series, Volume 2. Creative Media Partners, LLC.
11. For example, see: Barends, E., & Rousseau, D. (2022). *Organisational culture and performance: an evidence review. Scientific summary*. London: Chartered Institute of Personnel and Development; Chartered Institute of Personnel and Development. (2020). *Organisational culture and culture change*; Gifford, J., & Wietrak, E. (2022). *Organisational culture and climate: an evidence review. Practice summary and recommendations.* London: Chartered Institute of Personnel and Development; Li, S-A., Jeffs, L., Barwick, M., & Stevens, B. (2018). Organizational contextual features that influence the implementation of evidence-based practices across healthcare settings: A systematic integrative review. *Systematic Reviews, 7*, 72-91; Rudes, R. S., Portillo, S., & Taxman, F. S. (2021). The Legitimacy of Change: Adopting/Adapting, Implementing and Sustaining Reforms within Community Corrections Agencies. *British Journal of Criminology, 61,* 1665–1683.

solution will bring about change, to be clear on how impact will be measured, by whom, and when learning will be used to determine what happens next. Each of these map onto the three-step prototyping framework discussed below. It is the hypothesis of this author that following the evidence and adopting a prototyping approach will help to improve the organisational learning culture as it provides the practical framework ***for how*** to change culture.

Prototyping Framework

The Prototyping Framework discussed below aligns with the Double Diamond design process developed by the British Design Council for innovation,[12] and the Open Policy Making toolkit for digital design.[13]

Step 1. Diagnose: Love the problem, not 'your solution'

The focus on delivery, short timelines, and constrained funding cycles means that many teams are pushed to deliver solutions quickly.

Often, information about the problem we are trying to tackle is limited or unknown, and we haven't invested sufficient time to define the core issue. Implementing a solution that tackles symptoms risks just 'papering over the cracks' - a temporary fix that is more likely to fail over time. Implementing a solution that tackles the wrong problem is doomed to failure. As Russell Ackoff says, "Doing the wrong thing right is not nearly as good as doing the right thing wrong."[14] We may think we are moving faster by going straight to a solution, but we can, in fact, be wasting time and energy.

In addition, our need to make sense of the world means that we see problems as more predictable, tidier, and simpler to solve than they are.[15] This means that we can be overconfident and over optimistic that our solution will succeed. We become emotionally attached to the solution because we have advocated for it. In doing so, not only do we become responsible for the delivery, but we also become responsible for the outcomes. This makes it very difficult to change direction in the face of contradictory feedback or to admit that our proposed solution should be shut down.

Prototyping takes a different approach. It prioritises investing time to develop deep understanding of the problem within the context of where the intervention, service, or policy is to be delivered. The first step is to invest time to understand the system(s), the barriers people face when interacting with the existing system(s), and to understand their needs. This human-centred approach is a fundamental principle to design and achieved through both primary and secondary research.

Primary research could be observation, interviews, or surveys which seek to understand what is happening. Spending time with real people in real environments so you can observe them in the place where the problem occurs. Your research could be a behavioural diagnosis which identifies barriers or enablers of the desired behaviour, it could be mapping pain points[16] or the amount of 're-work' at various points in the system, it could be a root cause analysis with a diverse group of individuals who are involved in using or delivering the system, or it could be ethnographic research to observe the problem through the eyes of people involved at various steps in the process. Secondary research identifies existing evidence on the topic which could inform the problem. It could also involve using administrative data to quantify the size of the problem, specific cohorts who are impacted, or to understand current activity levels.

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This information from step 1 is synthesised into insights that help those involved to understand the main problems that need to be tackled. Synthesising large amounts of data into usable insight is a skill. Insight is only usable if it can be absorbed and used to inform people's thinking. Methods such as 'The Five Whys',[17] a Fishbone Analysis,[18] Problem Trees,[19] Journey Maps,[20] System Maps,[21] or Personas may help.

12. https://www.designcouncil.org.uk/our-resources/framework-for-innovation/
13. Open Policy Making toolkit - Guidance - GOV.UK (www.gov.uk)
14. https://ackoffcenter.blogs.com/ackoff_center_weblog/blog_post/
15. Kahneman, D. (2001). *Thinking Fast and Slow.* Penguin Books.
16. Pain points are specific challenges, issues, or problems that customers face in their journey while interacting with a product or service. These points are also an opportunity as they could identify an unmet need.
17. Swanson, R. (1995). *The quality improvement handbook.* Kogan Page
18. Majaro, S. (1988). *The creative gap: Managing ideas for profit.* Longman
19. Chevallier, A. (2016). *Strategic thinking in complex problem solving.* Oxford University Press.
20. Zemke, R., & Bell, C. R. (1989). *Service Wisdom: Creating and Maintaining the Customer Service Edge*
21. Government Office for Science (2022). *Introduction to systems thinking for civil servants.* Systems thinking for civil servants - GOV.UK (www.gov.uk)

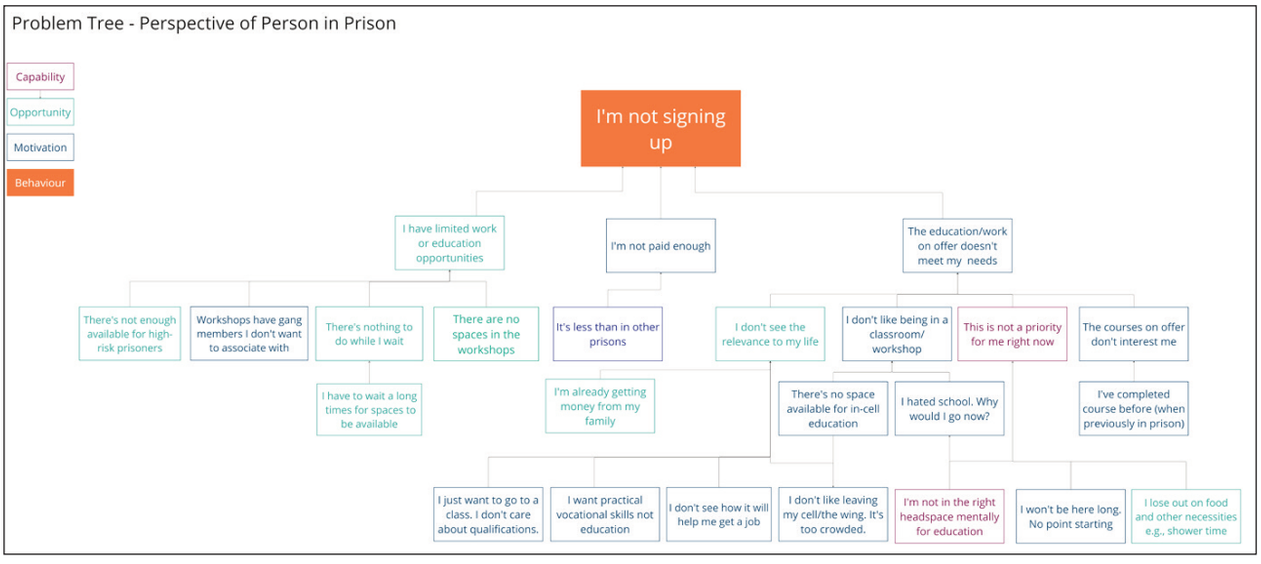
From this analysis, you need to decide who you are designing for and redefine problem statements as opportunity statements that invite broad exploration. It is unlikely that you can design one thing for the entire population, as people are not a homogenous group. You may want to define profiles which describe what different groups think, feel, do, and need. This could include the development of 'use cases' that you'd want to test at a later point.

Case Study – Why aren't prisoners signing up or turning up for Education, Skills, and Work (ESW)?

Working with the Reducing Reoffending Business Partnering Team in Data and Analysis and HMPPS Accelerator Prisons Programme, a behavioural diagnosis was conducted at three prisons to understand why people weren't signing up or turning up at ESW. This used an evidence-based framework called the Behaviour Change Wheel.[22]

Researchers spoke to 68 prisoners and 40 staff, and synthesised the data into problem trees, which showed whether the barrier was capability, motivation, or opportunity (see figure 1). Problem trees were produced from the perspective of staff and prisoners. These trees were used to show the breadth of barriers, the range of perspectives, and potential points where the prison could intervene to improve the situation. They were used in a co-creation workshop at each prison.

Figure 1. *An example problem tree on why people weren't signing up for ESW*



Step 2. Co-Design: Harness diverse viewpoints

Prototyping is predicated on the belief that you get to better solutions if you include diverse perspectives. Putting together a cross functional team to work on co-design will mean that you will gain broader perspectives. In a prison context this should include operational staff, prisoners or people with lived experience, senior leadership, as well as external experts.

In small groups we can be susceptible to the illusion of control and illusion of understanding.[23] We tend to prefer the illusion of certainty than the reality of complexity. This can mean that we emphasise consensus over dissent. Think about the makeup of teams to include dissenting views. If this is not possible, allocate someone to the role of 'devil's advocate' at different meetings.

If you are designing for a broad range of people, consulting people of different race, ethnicity, gender, age or religion is likely to provide important insight.[24] Including minorities in a group causes those in the visible majority to do a better job. The dominant group become more curious. A study that looked at decisions made by ethnically diverse groups of jurors versus white groups of jurors found that diverse groups took longer to consider the situations, examined the evidence more carefully, and made more 'right' decisions.[25] In a more diverse jury, white members asked more questions, raised more case facts and introduced fewer

22. https://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-6-42
23. Surowiecki, J. (2004). *The Wisdom of Crowds: Why the many are smarter than the few.* Little Brown Book Group.
24. Syed, M. (2019). *Rebel Ideas.* John Murray (Publishers).
25. Sommers, S. R., Warp, L. S., & Mahoney, C. C. (2008). Cognitive effects of racial diversity: White individual's information processing in heterogeneous groups. *Journal of Experimental Social Psychology, 44*, 1129-1136.

inaccuracies. This points to a complex relationship – a visible minority increases positive behaviours such as questioning, listening, and thoughtful reflection in the dominant majority.

Another reason why demographic diversity is key is because it creates 'cognitive diversity', differences in thinking, perspectives, and experiences. Including minority groups bring important new perspectives to group decision-making. For example, research with American and Japanese students showed that the two culturally diverse groups direct their attention to different things.[26] They were asked to watch videos of underwater scenes and then asked what they saw in the animation. American students described 'salient objects' such as the fish whilst the Japanese students described the context – the background, the weeds.

Once you have put your team together, start generating ideas about how you can tackle your problem. You can provide stimulus for the idea generation by looking at what the evidence says from other people in different geographies or in different contexts. There are many different methodologies that you can use. The innovation team in MoJ recommend the CLEAR IDEAs model which provides an easy framework for idea generation.[27] There are lots of resources that will help you to start generating ideas, such as Nesta's DIY Toolkit,[28] and This Is Service Design Doing.[29]

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The key point is to not shut down ideas too soon or jump on the first idea that comes along. At the idea generation stage, you want to create lots of different ideas and not be analytical. That comes later. Phrases like "Yes, but", "That's not what we do here", and "We've tried that before" should be prohibited. Nothing stops idea generation faster than critical voices. Quantity, not quality, is the aim at this stage.

The output of ideas generation should be some form of paper prototype.[30] At this stage, you are still in an exploratory phase. You may have several potentially viable prototypes that you want to take and test with a wider audience whilst still in a paper format. There is no 'right way' to build a paper prototype. The purpose is to make your idea tangible and concrete so that people can interact with it. It could be a storyboard, with the major scenes describing how change will come about, or a process map, which shows how the key groups interact with each other and the system and the steps that they must take to bring about change.

You can start to make decisions about which prototypes would be worth taking forward to the next stage. This is the point where you need to bring your analytical brain to the party. One way to narrow down ideas to take forward is for the design team to independently rate each prototype out of 10 based on feasibility and likely impact. Individual ratings can be aggregated to enable quick decisions to be made on the 'front runners'.

Case Study – Storyboarding with the Innovation Task Force

The Innovation Taskforce (ITF) wanted to develop interventions to improve safety and reduce suicide, self-harm, and violence in prisons. They conducted ideation sessions with people who live and work in prisons to come up with a wide range of solutions. Storyboarding was employed to investigate the viability and potential of the top ten ideas. The IFT created a storyboard for each of the ten ideas (see figure 2). Over 12 days, a multidisciplinary team spoke to 80 prisoners and 80 prison staff about the ten ideas. Following each session, the ITF were able to make decisions to discard, modify, and re-test the potential solutions.

The storyboards provided a simple and accessible model of the ideas which allowed prisoners and staff to identify potential barriers to success. As a result, the ITF discarded 5 ideas and made relevant changes to optimise the remaining interventions.

26. Masuda, R. N. (2001). Attending holistically versus analytically: Comparing the context sensitivity of Japanese and Americans. *Journal of Personality and Social Psychology, 81*, 922-934.
27. Birdi, K. (2021). Insights on impact from the development, delivery, and evaluation of the CLEAR IDEAS innovation training model. *European Journal of Work and Organizational Psychology, 30,* 400-414.
28. DIY Toolkit | Nesta
29. Method Library — This is Service Design Doing
30. Nesta (2011). Prototyping Public Services: An introduction to using prototyping in the development of public services.

Figure 2. *An example storyboard*

Step 3. Learn quickly: Test and refine your prototype

Testing prototypes should be quick and iterative. Nesta recommend a period of exploratory testing followed by more developmental testing. It depends how many prototypes you have at this stage. If you have three to five paper prototypes, you need to decide which to take forward and test 'live' in situ. This means that you want to 'bin' some of the prototypes and then refine one or two to get them to the best they can be. The prototype you take forward may be an amalgamation of the first couple you test, taking the best aspects of each to form a better holistic approach. Taking your paper prototypes to different people involved in the front line and asking for their critical feedback and improvements is the fastest way to do this. Front runners quickly emerge.

Developmental prototyping is when you learn in situ in one or two locations. Prior to testing in situ, you should build your paper prototype into a theory of change.[31] You will have learned a lot from your paper testing with regards to the context, assumptions, benefits, and potential backfire effects. Giving more thought to the activities, what outputs these will deliver, how these will translate to outcomes and impacts, and what assumptions you are making about how change happens will help you design your testing plan. Describing the context is equally important as this will influence how change happens.

Build a plan for which part of your theory of change you need to learn more about and then implement it in situ and set up feedback loops/measures to look at what happens. For example, you may want to test the mechanism of the prototype to see if change happens the way that you expect. So, imagine your prototype was to improve the healthy eating of families living in poverty, and you wanted to develop a voucher scheme to give people access to fresh produce. Prior to standing up the voucher scheme you may want to test the mechanism that access to more fresh produce translates into increased healthy eating.[32] To do this, you might give a cohort of people fresh food for a period and then observe what happens,

31. Anderson, A. (2005). *The Community Builder's Approach to Theory of Change: A Practical Guide to Theory Development*. New York: Aspen Institute Roundtable on Community Change.
32. Ludwig, J., Kling, J. R., & Mullainathan, S. (2011). Mechanism Experiments and Policy Evaluations. *Journal of Economic Perspectives*, 25, 17-38.

get participants to keep a food diary, and consider doing some limited bespoke data collection on changes to health.

You can test different parts of your prototype – it is best to focus on the riskiest part of how change might happen, the assumptions that you need to hold for your theory of change to deliver the outputs and outcomes. In the testing phase you are trying to assess three fundamental questions:

1. **Is there demand?** Assess whether the people who deliver or receive the intervention require it, to avoid rolling out policies with low take-up rates.
2. **Does it show promise?** Learn quickly whether the intervention shows signs of working and identify any potential concerns. At this stage, it is not possible to definitively conclude an intervention works as with traditional evaluation, but it is possible to get a strong signal that the intervention will not plausibly work.
3. **Can it scale?** Prototyping can identify the critical elements of the intervention that would need to be in place for it to be scaled more broadly. Scalability is an important consideration for determining whether an intervention is technically feasible and could represent good value for money.

Linked to point 2 above, prior to testing you need to establish 'stopping rules'. These are 'a state' and 'a date' – what do you need to see happen, and by when, to think that this prototype is worth pursuing. You should pre-specify your hypothesis, how you will test it, and what you expect to see. This will mean you are less susceptible to confirmation bias, which is the tendency to look for information that supports, rather than counters, one's preconceptions.[33] Once we have formed a view, we embrace information that confirms that view while ignoring, rejecting, or applying greater scrutiny to information that casts doubt on it. Confirmation bias suggests that we don't perceive circumstances objectively. We pick out those bits of data that make us feel good because they confirm our beliefs. Thus, we become prisoners of our assumptions. Remember 'feels good' doesn't mean 'does good'.

Confirmation bias suggests that we don't perceive circumstances objectively. We pick out those bits of data that make us feel good because they confirm our beliefs.

Fast feedback is the name of the game with developmental prototyping. If things aren't working on day one or two, change them. Don't wait for the end of a set period - refine your prototype as you go. You may want more formal learning moments to be built into your testing for more in-depth feedback but take advantage of every learning opportunity to optimise your solution.

At the end of your prototyping period, you have a few options for your next steps:

(1) **Bin it** – if it wasn't possible to operationalise it, or it didn't 'move the needle enough', (assessed via feedback/monitoring data) in terms of what you expected to achieve then you may think it is not worth pursuing. This is not a failure – it is a win. You have stopped something early, saving future resource costs, and you have learnt why it didn't work the way that you intended. Write it up as a 'lessons learned' and add it to an evidence library.

(2) **Replicate it** – you may want to do a further period of prototyping in a different location to see if the newly optimised prototype shows promise in a different context.

(3) **Evaluate it** – you may need to do more robust evaluation of your prototype. This will depend on what is proportionate. Not everything needs evaluation. If it is a strategic priority, has a high life-time cost, or has a limited existing evidence base, then you probably need to test it more robustly. Check out resources like the Evaluation and Prototyping Strategy for more information.[34]

Case Study – Embedding procedural justice in complaint responses.

HMP Buckley Hall introduced a new 'prototype' to help prison staff incorporate procedural justice (PJ) principles/content in complaint responses.[35] It consisted of a reflection workshop, a checklist and template, quality assurance check, and a coaching conversation to aid development if required (see figure 3). The HMPPS Evidence-Based Practice Team (EBPT), working

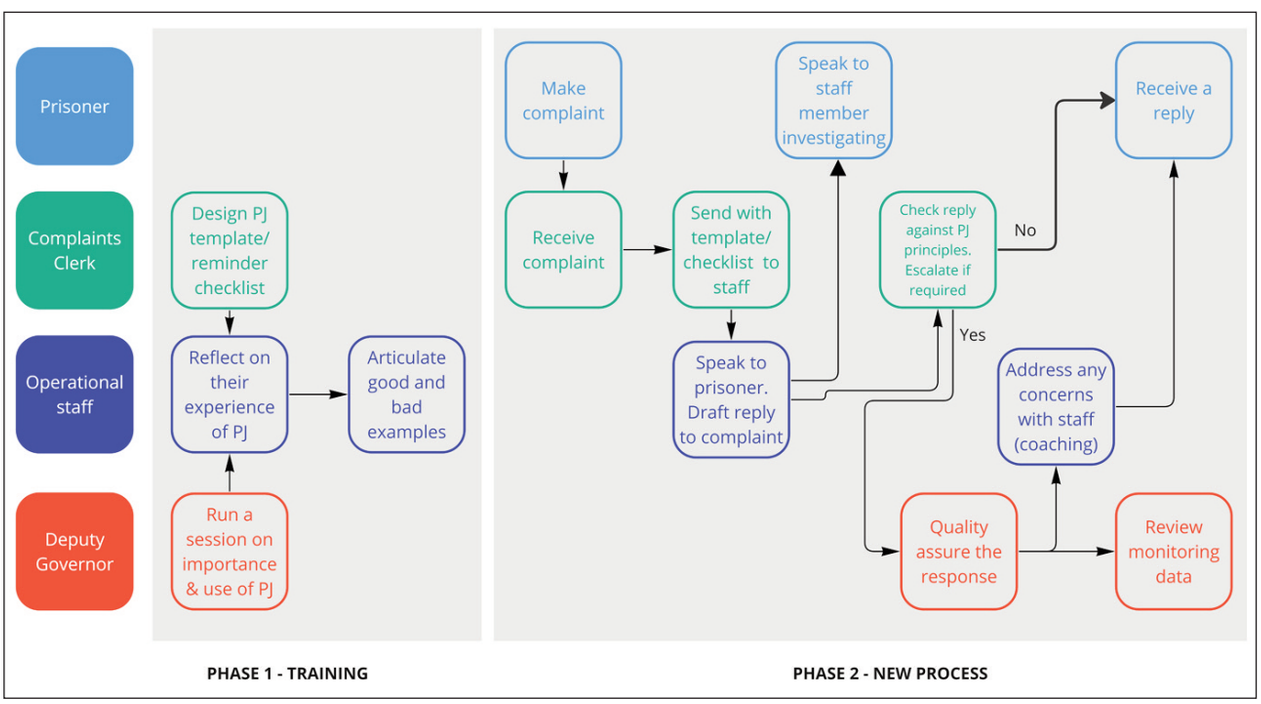
33. Lack, C., & Rousseau, J. (2022). Emerging Issues and Future Directions. In Comprehensive Clinical Psychology (2nd ed.). Elsevier Ltd.
34. MOJ Evaluation and Prototyping Strategy - GOV.UK (www.gov.uk)
35. Voisey, J., Fitzalan Howard, F., Wakeling, H., Cunningham, N., Lane, S., & Kirkpatrick, J. (2022). Closing the evidence to practice gap: how can we embed procedural justice principles into complaint responses to prisoners. *Prison Service Journal*, 263, 13-23.

in collaboration with the Evaluation and Prototyping Hub, wanted to know (a) if people used it, (b) if it changed behaviour, and (c) whether it would work in another prison who hadn't developed the prototype.

To answer (a) and get an indication of (b), the team retrospectively sampled complaint responses before and after the new prototype was introduced at Buckley Hall and developed a tool to code the amount of PJ content. People used the prototype, it showed promise in increasing the amount of PJ language but there were concerns about how genuine the response felt. There was also a limited 'voice' from prisoners.

The team updated the prototype and the coding tool and to answer (b) and (c) re-tested in HMP Featherstone. The team used a randomised control trial which is more robust and included some qualitative research to get feedback from staff and men. This was based on similar rapid cycle testing practice from the US by an organisation called BetaGov who had presented the benefits of this approach to the team.[36] As this was a more robust method, the team were able to conclude that the prototype did cause the adoption of PJ content, and this was maintained for over six months. The team included a replication check which meant they were more confident that the prototype caused the change in content. Staff found that the prototype made it easy for them to use more PJ and that it prompted them to talk to men as part of the process.

Figure 3. *Prototype from HMP Buckley Hall which was tested at HMP Featherstone*



Summary

Prototyping is a great way to bring people together to tackle existing problems. Whilst it is impossible to 'fix' inherently difficult social problems, it is possible to continuously improve what we do to give people better opportunities and outcomes. Prototyping means that risky assumptions are tested early so things that are not feasible are stopped quickly. Prototyping also optimises interventions prior to robust evaluation, which gives any intervention has a much greater chance of success. Prototyping, together with evaluation, will help maximise our impact, identify innovative evidence-based approaches to improve the justice system and make the best possible use of public money.

36. https://www.betagov.org/html/trials.html