

# Co-design Stage Guide



## Summary

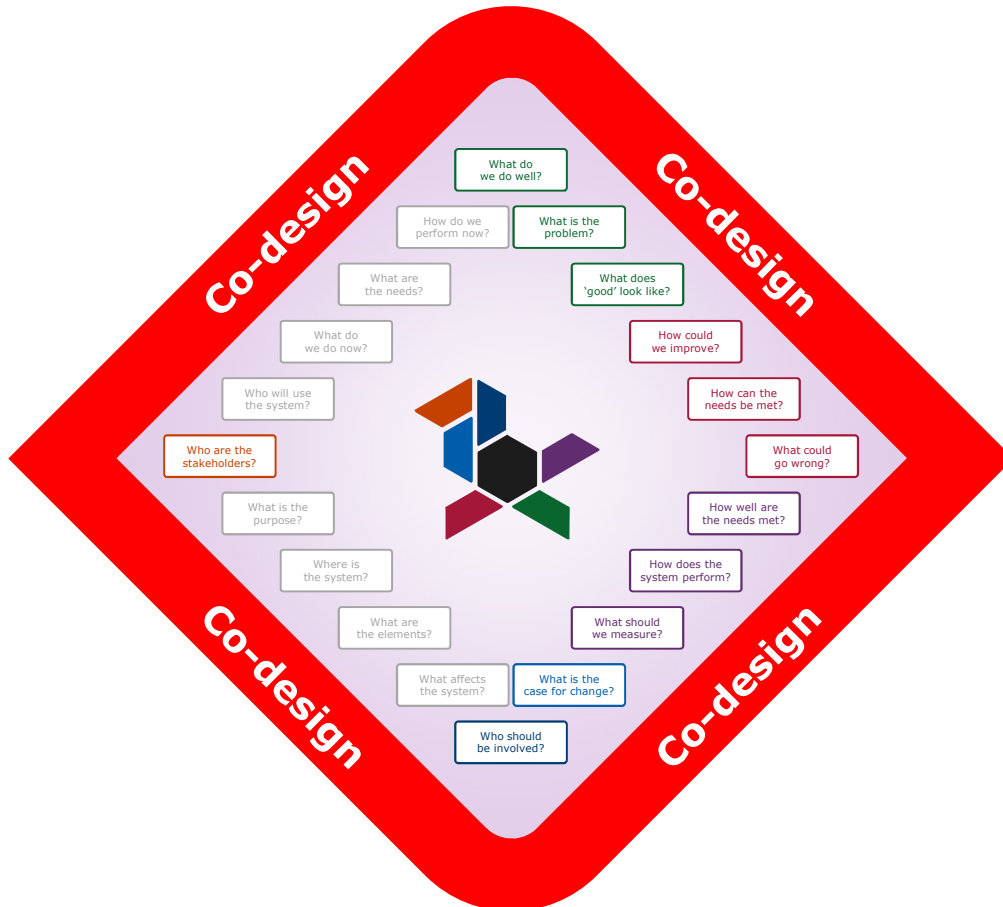
This guide provides a brief description of the application of a systems approach to the co-design stage of health and care design and continuous improvement.

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# Introduction

This guide is part of the University of Cambridge **Improving Improvement Toolkit**, which develops the approach presented in the Royal Academy of Engineering report titled "[Engineering Better Care](#) – a systems approach to health and care design and continuous improvement".



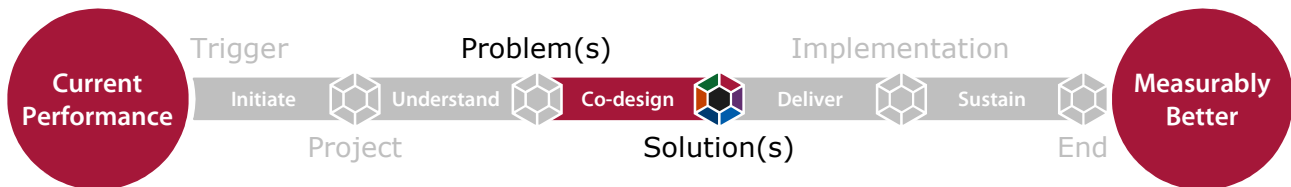
Engineers routinely use a systems approach to address challenging problems in complex projects. This allows them to work through the implications of each change or decision they make for the project as a whole. They consider the layout of the system, defining all the elements and interconnections, to ensure that the whole system performs as required.

**“Systems that work do not just happen — they have to be planned, designed and built”**

This particular guide assists in the definition, visualisation, planning and execution of the **Co-design Stage** of the Improvement Programme. The questions and activities highlighted here provide a minimum suggested set for the stage and may be supplemented with other familiar activities.

# Introduction

The following steps, described in more detail below, describe possible elements of a systems-based approach for planning the [Co-design Stage](#) of an improvement process — leading to a description of the current system (now), a common understanding of the problem, a consensus view of what the future system might look like (better) and a clearly articulated solution(s) to change the system.



- (1) **Improvement Canvas** – Describe the context and nature of the challenge and current ideas for co-designing and delivering improvement.  
Agree the scope of the proposed improvement or decision-making process and identify the team required to deliver it.
- (2) **Stakeholder Influence** – Identify key stakeholders, their interest in the system and potential to influence the outcome of the process.
- (3) **Stakeholder Needs** – List the full range of stakeholders’ essential needs and their particular reasons for these needs.
- (4) **Morphological Chart** – Organise the presentation of ideas and concepts to facilitate the co-design of solutions to the challenge.
- (5) **Bowtie Method** – Identify deviations from normal operation and their undesirable consequences for the proposed improvement.
- (6) **Design Solutions** – Translate the initial ideas into viable concepts and solutions that meet the system requirements.
- (7) **Persona Responses** – Capture likely persona responses to the concepts and solutions proposed for the system improvements.
- (8) **Stage Plan** – Define the outputs or outcomes required for the each of the strands of the improvement or decision-making process.  
Select the activities and tools required to deliver these outputs and the critical dependencies between them.

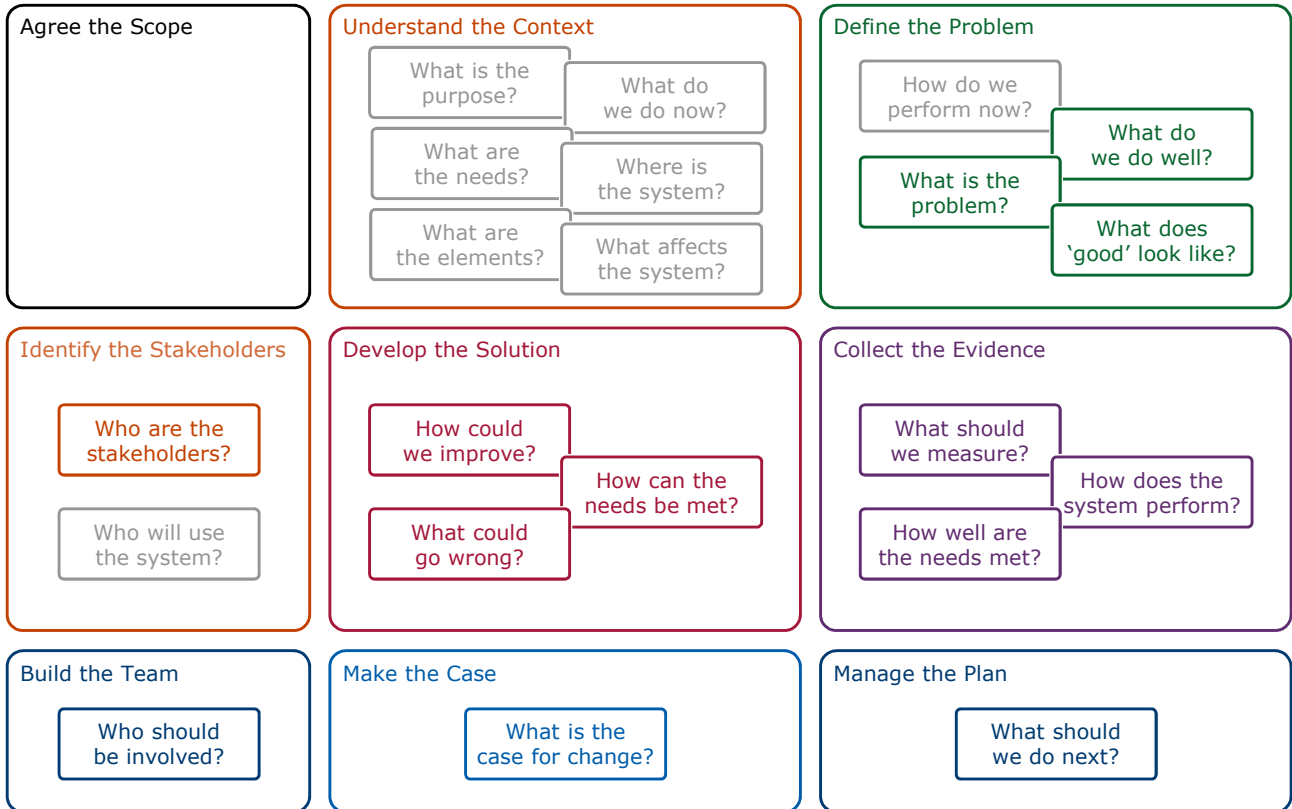
There is particular value in completing a preliminary Improvement Canvas and draft Stage Plan early in the stage to facilitate the building of an appropriate team for this and/or subsequent stages. Individual outputs for this stage can be recorded at the end of the guide and may then provide the basis for a stage-gate review.



**Useful toolkit resources:** printable PDFs for all of the **Stage Guides** are included in the [Stage guide PDFs](#) part of the [Resources](#) section.

# Improvement Canvas

Use the [Improvement Canvas Poster](#) to investigate the team's current knowledge about the system and agree the scope of the change required.



A clear articulation of the scope helps to define the boundary between what is in and what is out of the system of interest. It also reflects the prioritised needs of the stakeholders that should drive any improvement. The scope will also be influenced by the context of the system, primary focus of the challenge, core themes of possible solutions and level of detail required to describe the system and its stakeholders.

At the beginning of each stage of the improvement programme it is important to reaffirm the content of the canvas and scope of the challenge. This helps to define the gap between what is known at the start of the stage, the needs to be met by the end of the stage, and the plan to move between them.

The questions of particular interest to the **Co-design Stage** of the Improvement Programme are highlighted in colour above.

# Improvement Canvas

Use the [Improvement Canvas Worksheet](#) to describe the team's current knowledge about the system and agree the scope of the change required.

Agree the Scope	Understand the Context	Define the Problem
Identify the Stakeholders	Develop the Solution	Collect the Evidence
Build the Team	Make the Case	Manage the Plan

The canvas may be completed in any order, with input from the stakeholder influence and stakeholder needs worksheets informing the stakeholder and team boxes, from the system boundaries and rich picture understanding the context, and from the design themes and persona descriptions defining the problem.

All entries are important in capturing the team's current knowledge about the challenge, and in determining a sensible starting point and scope of interest for improvement. Ideas of solutions inspire a deeper understanding of the problem, and

The questions of particular interest to the **Co-design Stage** of the Improvement Programme are highlighted in colour opposite and may be answered, in part, by completing some or all of the template that follow.

# Stakeholder Influence

Use the [Stakeholder Influence](#) worksheet to identify key system stakeholders' interest and influence.

Low Interest and High Influence (satisfy)	High Interest and High Influence (manage)
Low Interest and Low Influence (monitor)	High Interest and Low Influence (inform)

Successful improvement depends on a wide range of stakeholders and system users who, at any point in time, will have different levels of interest in and power to influence such improvement. They will bring a range of perspectives to any programme and through their action or inaction can enable, actively encourage or frustrate progress.

There is value in characterising stakeholders, in terms of their interest and power, to ensure that they are sufficiently informed, engaged or managed at all stages of an improvement programme. Understanding them and their relative importance is an essential element of managing change.

Use the worksheet to remind the team of the stakeholders related to the improvement process, to capture the particular needs of the individual stakeholders, and to highlight the range and diversity of stakeholder needs.

# Stakeholder Needs

Use the [Stakeholder Needs](#) worksheet to list the system stakeholders' needs and reasons for those needs.

As a ...	... I need ...	... so that ...

Stakeholders are defined by their role, needs and reasons for those needs. It is useful to capture this information in the form " As a ... ... I need ... ... so that ... " where these statements provide insights into needs and the rationale for them.

Stakeholders may have multiple and diverse needs and associated rationales, which provides the basis, with their interest and influence, for early conversations to prioritise these needs. Such needs may also vary with time and, therefore, in importance to other stakeholders over time.

Use the worksheet to remind the team of the stakeholders related to the improvement process, to highlight the range and diversity of potential stakeholders, and to accentuate the importance of understanding stakeholders needs.

# Morphological Chart

Use the [Morphological Chart](#) worksheet to organise the presentation of ideas and concepts to facilitate system improvement.

Functions	Option 1	Option 2	Option 3	Option 4

The morphological chart provides a means to capture the key requirements of a system alongside a range of possible means to satisfy those requirements. Potential solution concepts can be created from combinations of ideas, highlighting both the architecture of the solution and its elemental parts.

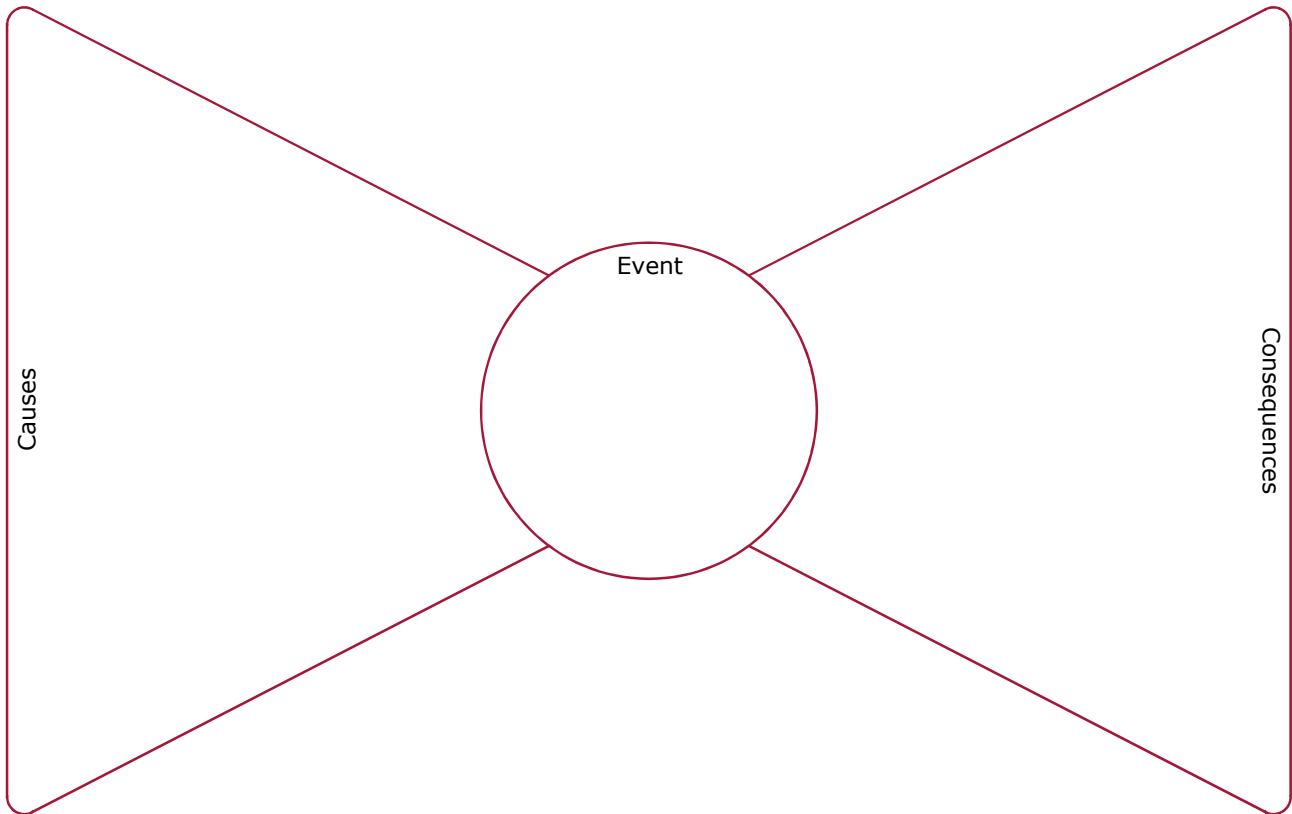
List the functions, features or themes that describe the nature of the design challenge in the first column of the chart, followed by a number of ideas that may satisfy these in subsequent columns. Viable solution concepts, comprising at least one element from each row, can then be identified.

Use the template to capture a variety of ideas with potential to fulfil key functional requirements, to identify combinations of ideas that will satisfy the overall system requirements, and to accentuate the importance of identifying alternative system architectures.



# Bowtie Method

Use the [Bowtie Method](#) worksheet to identify deviations from normal operation and their undesirable consequences.



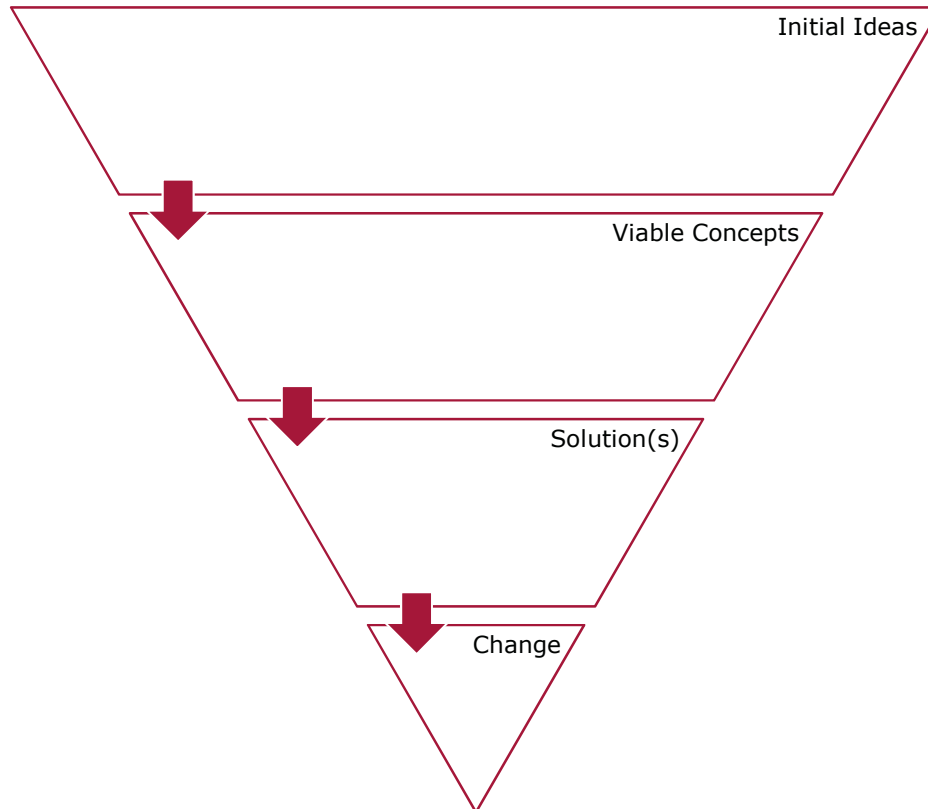
The bowtie method is a useful visual summary of risk management practices targeted at a particular high-risk threat. Elements shown to the left of the event summarise steps taken to eliminate the threat and elements shown to the right capture steps to mitigate the impact of the threat.

Identify a critical threat to the operation of the system and describe it at the centre of the bowtie. Possible causes of the threat and barriers to block them can be sketched to the left, and potential consequences and barriers to block them to the right. Any likely degradation of these barriers can also be identified, along with steps to monitor or eliminate such degradation.

Use the worksheet to visualise the links between causes of an event and potential consequences, to identify the barriers between the causes and potential consequences, and to understand the impact of possible degradation of the barriers over time.

# Design Solutions

Use the [Design Solutions](#) worksheet to translate initial ideas into viable concepts and solutions that meet the system requirements.



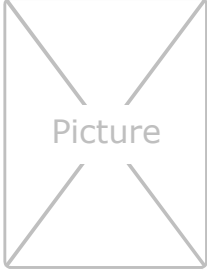
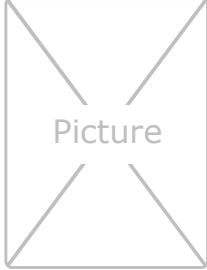
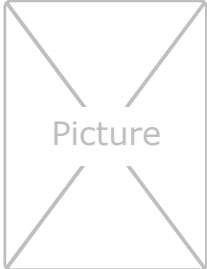
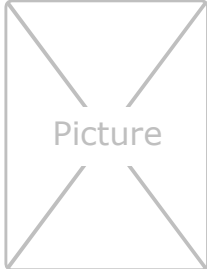
The delivery of an effective improvement process requires careful identification of initial design ideas and their integration of into viable concepts and solutions with the aim of the delivering realisable system change. This is a complex, iterative process, critical to the success of the whole programme.

Initial ideas that provide elements of an overall solution to the system requirements must be generated and captured. A number of these can be integrated into viable concepts that inspire the design of a solution to the design requirements. This in turn can be incorporated into a programme to deliver measurable change.

Use the worksheet to present the initial ideas generated in response to the system requirements, to highlight the viable concepts inspired by the initial ideas, and to summarise the solution(s) developed from the viable concepts.

# Persona Responses

Use the [Persona Responses](#) worksheet to capture likely persona responses to proposed systems improvements.

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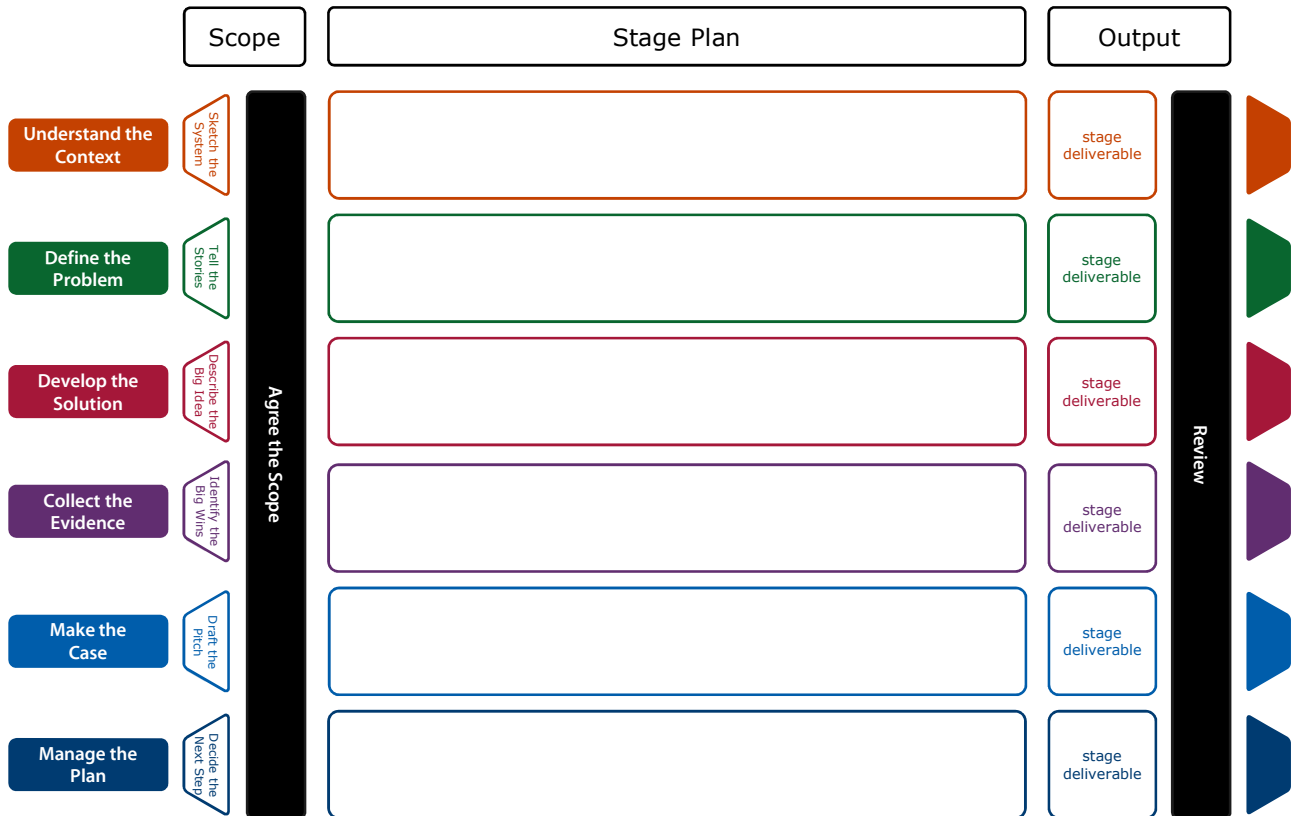
Personas are fictional characters which are created, based upon appropriate research, to represent the full range of different user types that might use a service, product, site or brand.

Using the previously created personas, predict their likely response to proposed improvements or changes to the system. Individual team members may wish to 'adopt' personas to review the changes, helping them to empathise with people with different needs and expectations, and to better identify with the stakeholders and system users.

Use the worksheet to predict the response of people within a chosen stakeholder group, to facilitate a preliminary evaluation of their response to a given situation, and to provide a simple means to reflect on stakeholder diversity that matters.

# Stage Plan

Use the [Stage Plan](#) worksheet to select the most important elements of the improvement process that are required to deliver the desired outputs.

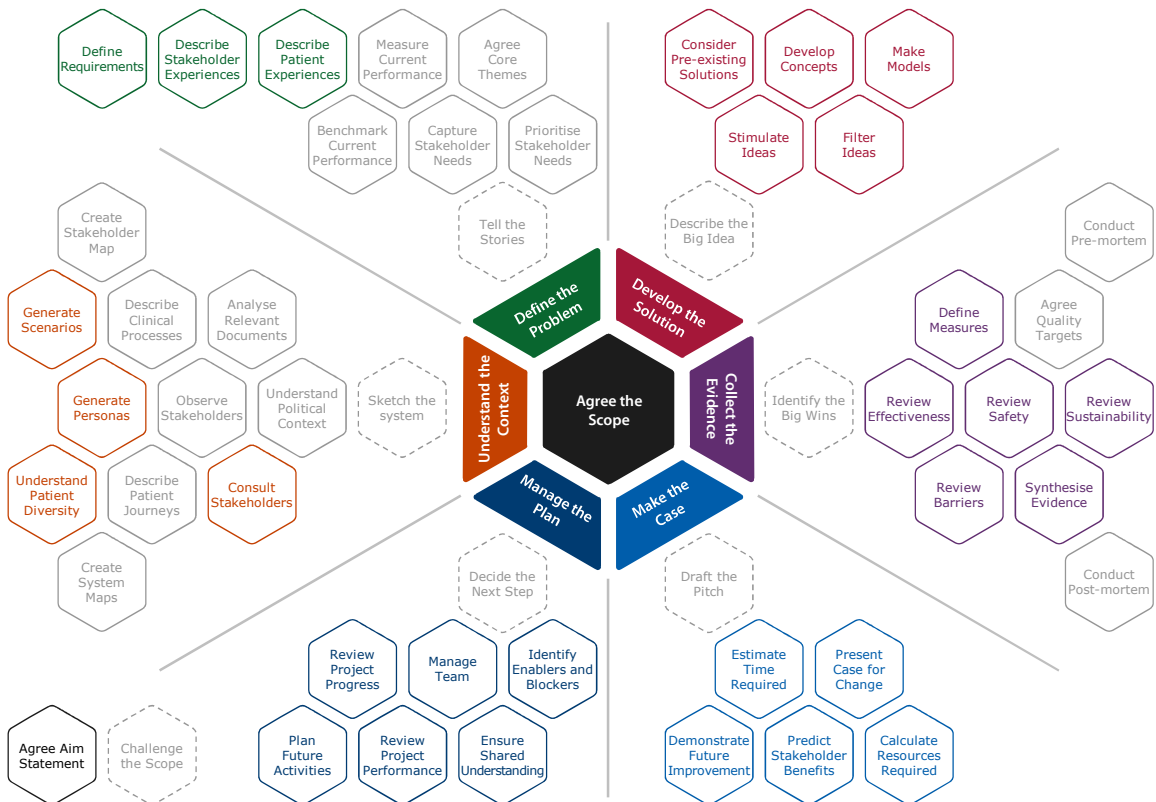
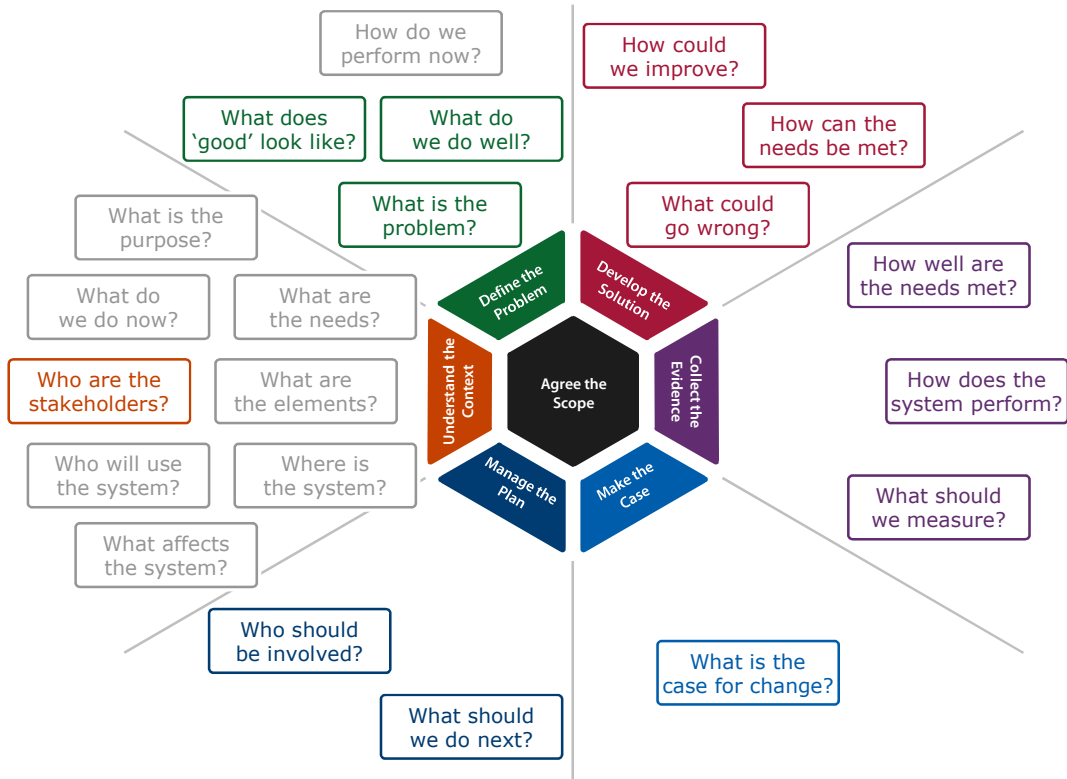


This model underpins the stage gates of an Improvement Programme, where progress is driven by clear objectives for each of the key elements at each stage of the programme.

The desired outputs or outcomes should be identified, based on the content of the Improvement Canvas for the **Co-design Stage** of the Improvement Programme and the particular objectives of this stage.

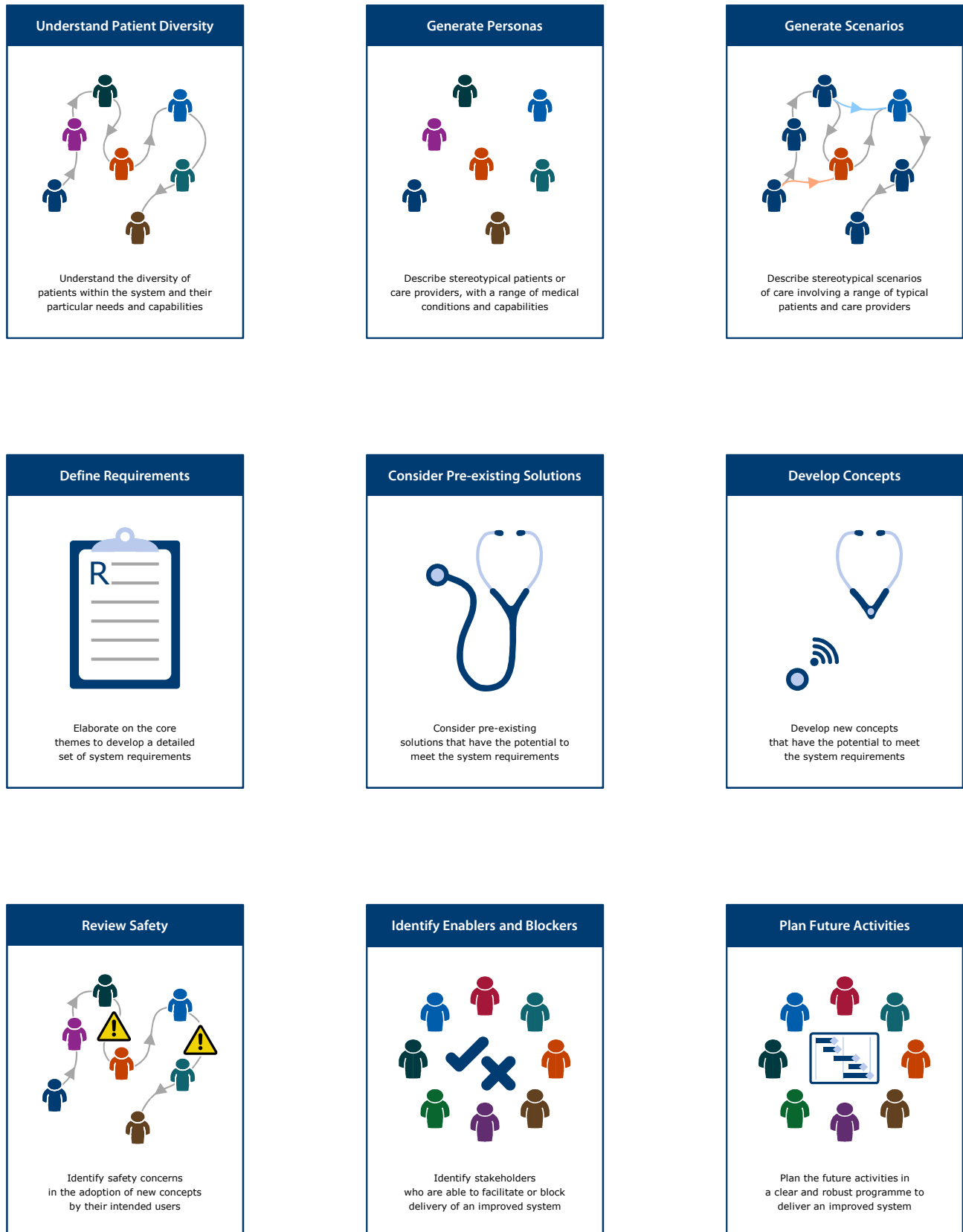
The stage plan should identify the questions and activities that are required to achieve the specific understand stage deliverables. They are more likely to focus on understanding the context of the challenge and on defining the problem. Later stages will see a shift in focus to developing the solution and collecting the evidence. All stages should reflect the need to make the case and manage the plan.

# Stage Plan



# Stage Plan

A sample of possible [Activities](#) which may be added to the co-design stage plan.



# Stage Plan

A sample of possible [Tools](#) which may be added to the co-design stage plan.

**MoSCoW**

A means to capture a prioritised list of must, should, could and won't have requirements for improvement

**Brainstorming**

A means to encourage the generation of ideas and concepts to facilitate system improvement

**Morphological Chart**

A means to help organise the presentation of ideas and concepts to facilitate system improvement

**Designing Personas**

A means to create representations of stereotypical users and their conditions, capabilities or responsibilities

**Designing Scenarios**

A means to create the stories of stereotypical users reflecting their conditions, capabilities or responsibilities

**Bowtie Method**

A systematic approach for visualising links between causes of an event and potential consequences

**Project Canvas**

Scope	Context	Problem
Stakeholders	Solution	Evidence
Team	Case	Plan

A dynamic summary of a programme of improvement to encourage team consensus

**Stakeholder Analysis**

	High Interest		
Low Power/Influence	Defenders	Drivers	High Power/Influence
	Bystanders	Blockers	
	Low Interest		

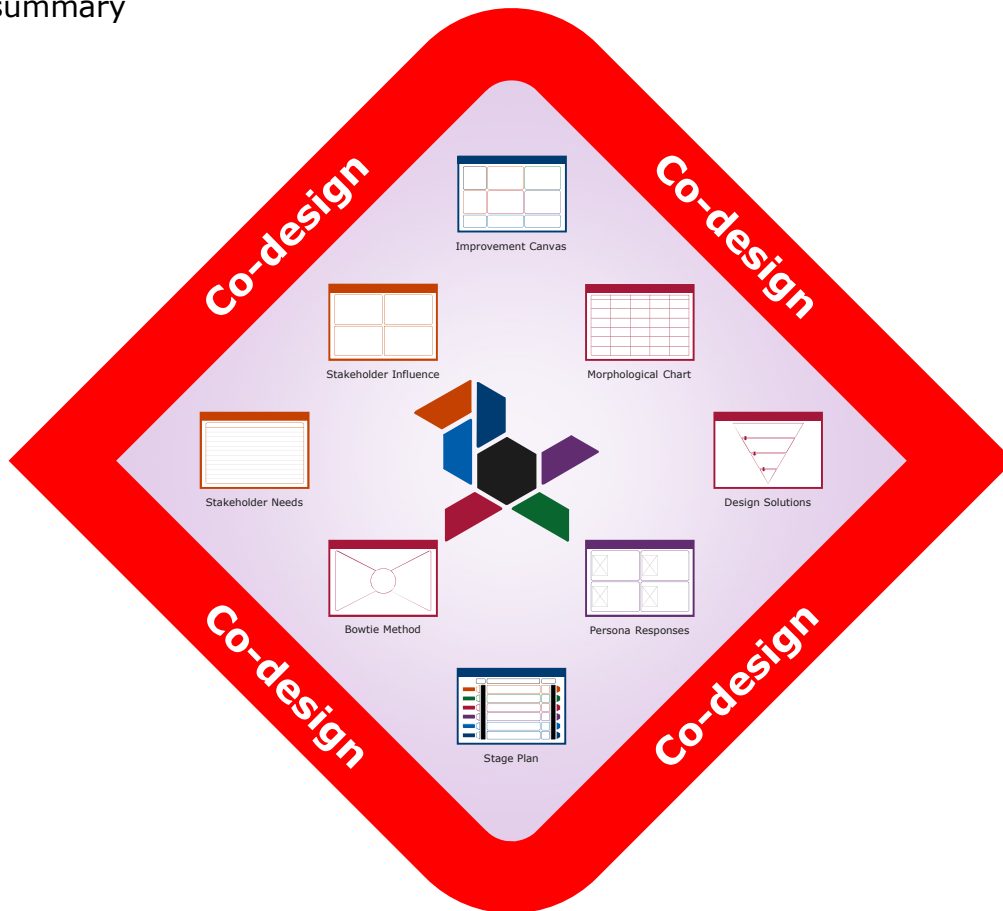
An analysis of the potential for stakeholders to drive or block the outcome of a proposed change

**Gantt Chart**

A bar chart to illustrate the schedule required to deliver a programme of improvement

# Stage Outputs

Activity summary



	Co-design Output	Narrative / Authors / Date
✓	Agreed Scope	
✓	Stakeholder Needs	
✓	Stakeholder Influence	
✓	Solution Ideas	
✓	Solution Concepts	
✓	Initial Risk Review	
✓	Persona Responses	
✓	Case for Deliver	
✓	Other	
✓	Other	