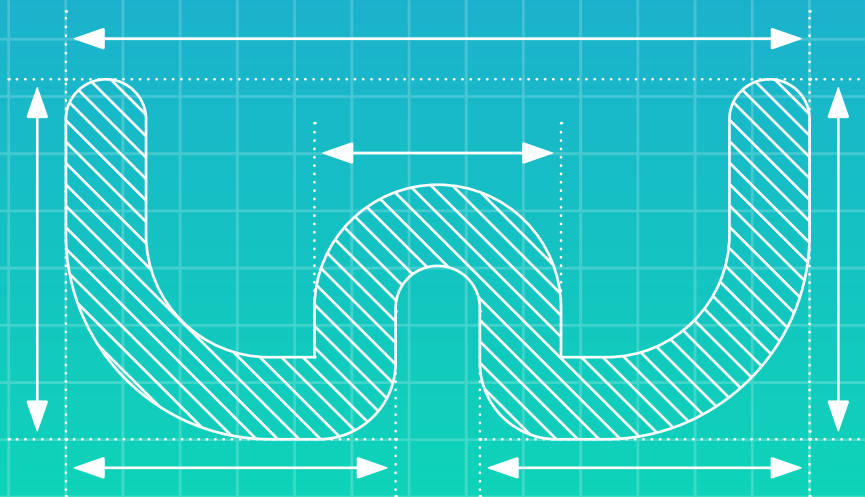


VR4REHAB INNOVATION BLUEPRINT



**The practical step-by-step guide to
turning ideas into (virtual) reality.**

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VR4REHAB

Innovation Blueprint

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Introduction

Dear fellow Healthcare Innovation Pioneer,

The Blueprint you are about to read is the result of a beautiful journey called VR4REHAB. We, your travel companions on this journey, are proudly sharing our insights, our mistakes and our magic tricks in order to help you with your own adventures. Please read it, share it, complete it with your own insights and pass it on to others. This is shareware.

Our VR4REHAB journey began with the expectation that Virtual Reality (VR) could help us improve rehabilitation across 4 key aspects:

1. Transforming boring, repetitive tasks into attractive games to improve therapy adherence
2. Using data from these games in order to measure progression
3. Adjusting the intervention to the patient's needs
4. Bringing the therapy to the patient's own home

Within the scope of our project, we were lucky to team up with hospitals, universities, healthcare networks, VR tech networks and SMEs. We started from scratch by generating ideas in our 5 Hackathons, then developed prototypes in our Game Jams. At present, we are transforming these prototypes into real products in various Challenges.

This Blueprint is, however, not about these ideas, prototypes or products. It's about our way of working, how we organised our innovation process, what we learned, what went well and what went wrong.

Simply, we wrote down what we did and how we did it; if you are about to organise your own Hackathon, Game Jam or innovation challenge, it might be useful. We hope that - as you read along - you get inspired by our insights and we hope you can avoid making the same mistakes we made!



But most of all, we wish you the best of luck on your own innovation journey.

Remco Hoogendijk

Innovation Manager, Sint Maartenskliniek

Lead Partner Interreg North-West Europe Programme - VR4REHAB
Project

Icons and terms used in this Blueprint

Icons used in this Blueprint



XP Boost

Handy tips to help you and your teams get the most out of the innovation process.



Cheat Code

Recaps of key information, plus pointers to relevant sections for revisiting earlier topics.



Critical Hit

Highlighting make-or-break moments to guide your Innovation Project to success.

Terms used in this Blueprint

Stakeholders

Everybody you and your various teams get into contact with both during and after your Innovation Project. Stakeholders vary in importance and influence, but it is important to be aware of who they are. See the Stakeholder Map in Part 1, Section 3 to classify your Stakeholders.

Project Partners

The organisations that have collaborated to set up the Innovation Project and organise the Hackathon.

Core team members

The people in your various teams who join Hackathons for the purpose of working on their innovative concepts for the duration of the Innovation Project and beyond.

Participants

People that join Hackathons and Game Jams to provide your core team members with knowledge and support. They will most likely not join the Innovation Project for its full duration.

Beyond the Blueprint

Who knows what the world will look like in 5 to 10 years? There's no doubt that, with an ageing population and an increasing shortage of frontline healthcare workers, a drastic paradigm shift is needed. A shift from curing everybody, regardless of personal wishes and needs, to addressing personal wellbeing and happiness. You might be wondering whether this applies to rehabilitation as well. In reality, that is a personal decision taken by each person, at best in collaboration with a medical professional. You can imagine, I'm sure, that some people may prefer to use a wheelchair for the rest of their lives rather than endure a lengthy and painful rehabilitation process that involves far too many weekly - or even daily - hospital visits, or a lengthy stay at a rehabilitation centre.

By using VR and gamification in rehabilitation, our aim is to support this paradigm shift. Introducing these forward-thinking methodologies means the rehabilitation process can largely be transferred from hospitals or rehabilitation centres to the patient's own home. We are convinced that further development of VR will be groundbreaking, as continuous innovation of VR techniques results in more easily accessible and attractive solutions. This will enhance the paradigm shift that's so vital to the future of healthcare, as at-home treatments contribute to patients' personal wellbeing and happiness.

Perhaps not in 5 years, but most likely in 10, the number of rehabilitation centres will have reduced significantly. Imagine a reality in which a central coordination and patient monitoring centre could remotely guide, instruct and monitor each patient's rehabilitation journey. It would be a truly transformative change in the rehabilitation sector.

With this Blueprint, we aim to accelerate progress towards that reality, making crucial breakthroughs in the rehabilitation process for the benefit of future patients.

PART 1

Setting Up Your Innovation Project

IN THIS PART

- **Formulating your project goal**

- **Setting up your Hackathon**

- **Introducing Moonshot Thinking, Design Thinking and Conceptualisation**

- **Looking ahead to Prototype Development**

PART 1 | SECTION 1

Formulating Your Goal

IN THIS SECTION

→ **The role of gamification**

→ **An overview of the innovation process**

Before we dive into the specific learnings from the VR4REHAB project, we want to take a look at gamification for healthcare and rehabilitation innovation more generally.

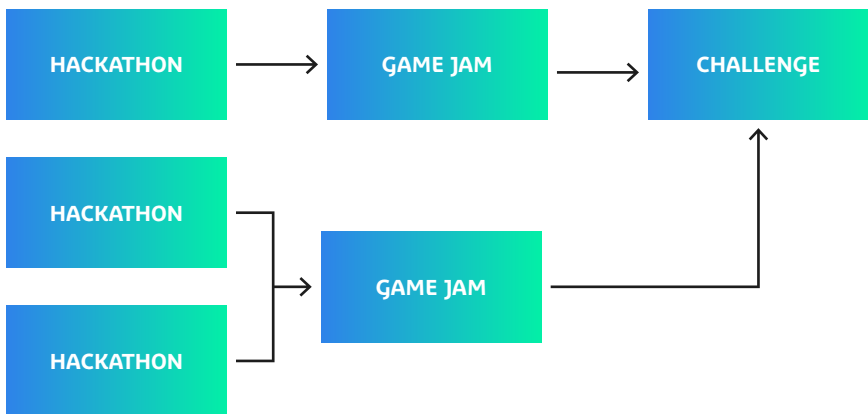
Over the years, the work at VR4REHAB Project Partner Games for Health has shown that the future of healthcare innovation is inextricably linked to a serious love of gaming. Gaming provides an engaging platform for accelerating patient learning processes to boost their rehabilitation. Gaming also smooths and supports changes in patients' behaviour, creating entertaining experiences to radically improve patients' experiences of their rehabilitation process.

The instinct to play is built into human beings' DNA. Given you're joining us on our quest to revolutionise rehabilitation with VR, we've got an inkling that you feel the same. VR is a fast-growing tool in healthcare that looks set to characterise the future of the sector.

In this Section, we'll walk you through the general learnings we've taken from designing hundreds of innovative, serious games. The benefits of these games have been scientifically proven over the years, leading to their implementation as medical rehabilitation methods.

So, we've really racked up the Experience Points - also known as XP, you'll find handy tips to boost yours throughout this Blueprint! We've found that a co-creative process that involves all the relevant Stakeholders is key to designing VR innovations for better, more personalised rehabilitation care.

Figure 1. An overview of the innovation process.



PART 1 | SECTION 2

Preparing the Process

IN THIS SECTION

→ **Outlining the Hackathon strategy**

→ **Introducing the Prototype Development stage**

Here, we'll lay out the phases involved in the Hackathon methodology and how we carry these forward into Prototype Development.

Hackathon

VR4REHAB Project Partner Games for Health developed a specific Hackathon concept as a standardised methodology for innovation in rehabilitative gaming. The Hackathon uses multiple industry-standard methodologies in a multi-criteria analytical decision-making process. To date, it's been carried out hundreds of times based on the following format:

Duration	1-2 days
Number of participants	Maximum 12 persons, representing all key Stakeholders
Outputs	<ol style="list-style-type: none">1. Harvest document with workshop process report;2. Stakeholder debriefing document, including functional description, design sketches and stakeholder feedback



XP Boost

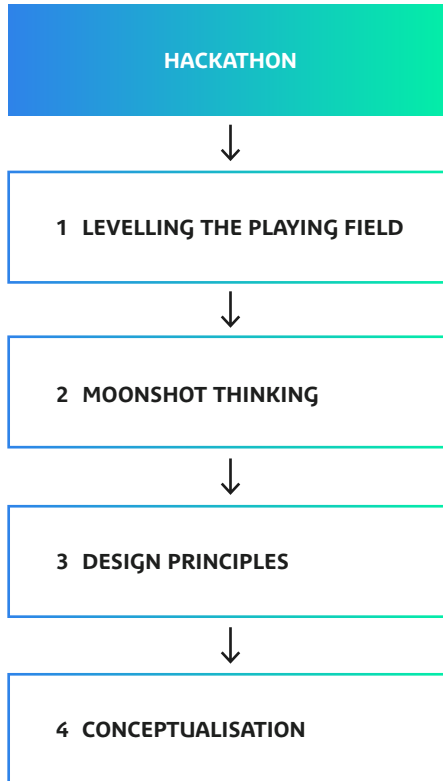
It's vital to have facilitators present at the Hackathon, including domain experts, patients, a team of skilled game designers, behavioural scientists, script writers, visual designers and technicians.

VR4REHAB used the Hackathon methodology developed by Games for Health to underpin this project. For VR4REHAB, the debriefing document consists of a functional description that responds to all queries surrounding the development of new rehabilitation methods.

The Hackathon consists of 4 major phases:

- 1. Levelling the Playing Field**
- 2. Moonshot Thinking**
- 3. Design Principles**
- 4. Conceptualisation**

Figure 2. An overview of the Hackathon phases.



Phase 1: Levelling the Playing Field

What do we mean by levelling the Playing Field? Essentially, this step is designed to create a common language among the Stakeholders. A shared language in which all the Stakeholders can express themselves and communicate their ideas is key to designing a high-quality game.

Why do we perform Phase 1?

Experts in the fields of game design and organisational and behavioural change need to understand the Stakeholders' knowledge areas to such an extent that they can effectively ideate solutions that fit current and future healthcare and rehabilitation ecosystems. At the same time, the Stakeholders need to acquire working-level knowledge of game design and organisational and behavioural change in order to act as involved partners in ideating these forward-thinking solutions.

What methods do we use in Phase 1?

Presentation and reflection tasks involving all participants

Experts and Stakeholders present their perspectives and reflect on these presentations in a discussion session. This aims to create mutual understanding, in order to ensure that all participants are on the same page. In particular, participants should take some time to hone in on personas and stakeholder language. Defined personas streamline the process by acting as guidelines to avoid discussions that stay too high-level and general. Personas also act as a useful tool to outline relevant stakeholder language.

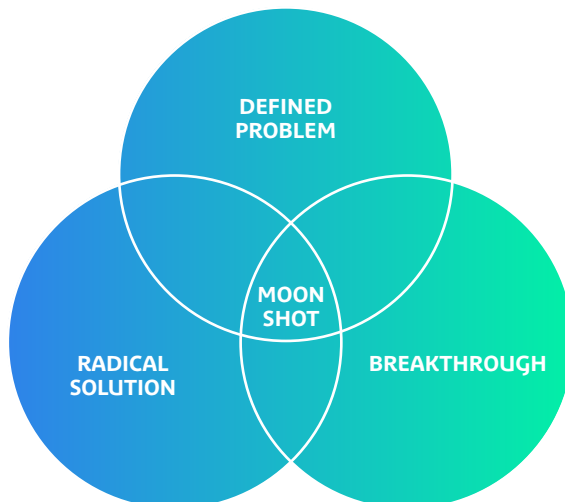
Phase 2: Moonshot Thinking

Moonshot Thinking is an adapted version of the scenario-based reasoning methodology developed by NASA to support its Apollo moon landing missions. Originally, NASA engineers envisaged what

the astronauts' successful return to Earth from the moon mission would look like. Once they had that scenario in mind, they worked backwards to design what was needed to make it a reality. Many of the groundbreaking tests that were carried out in those early days only make sense if we look at them from this perspective of revolution in reverse: moving innovation forward using the radical approach of looking back.

The term Moonshot Thinking is now widely used to refer to scenario-based reasoning methodologies. Your Moonshot idea lies at the intersection between a problem that's clearly defined, a proposal of a radical solution for it and the breakthrough technologies that show you it might just be possible to bring your radical solution into reality (i.e., it is feasible and executable).

Figure 3. The Moonshot Thinking methodology.



Moonshot Thinking is popular with multiple giants of innovation, including Google which has established X, the moonshot factory.

Why do we perform Phase 2?

All too often, we make incorrect assumptions about the organisational and behavioural changes that are needed to solve a particular problem. Using Moonshot Thinking, we can reveal, analyse and evaluate these baseline errors, learning from them and setting ourselves on the right innovation pathway. This helps to ensure that time and money are invested in the best ideas, right from the get-go.

What methods do we use in Phase 2?

Ideation in all its forms, covering innovation, development and creative realisation

Though there are several ideation techniques (such as opposite thinking, analogy thinking, brainstorm cards, collaborative sketching, storyboarding, etc.), we applied the Mash-Up method, a fast and fun ideation technique that brings odd or unexpected things together to spark fresh ideas. So, how does it work? The first step is to define a How Might We (Moonshot) statement. After defining your challenge, pick 2 broad and unrelated categories. At least 1 of those 2 categories should tie into your Challenge. The next step is to create a list for each category, filled with elements of these 2 experiences. Try to list as many items as possible in 2 minutes. Then, it's time to Mash-Up! Combine items from both lists to generate new ideas. Try mashing up items that seem the most different and see if you can communicate the value of your inventions in ways that are relevant to your Challenge.

Phase 3: Design Principles

During this Phase, we focus on bringing about organisational and behavioural change, as well as the actions of the end users who'll be playing the game as part of their rehabilitation process. In order to design our desired structural and behavioural change outcomes, we use the *Fogg Behavior Model*.

Why do we perform Phase 3?

According to Stanford University Behaviour Scientist BJ Fogg, PhD's model, changing people's behaviour fundamentally hinges on placing prompts in the path of motivated individuals. So, in order for rehabilitation games to bring about behavioural change, they need to include elements that effectively prompt motivated players to act.

What methods do we use in Phase 3?

Developing working words and game mechanics to prompt end user action

In these sessions, you collect words and activities which motivate and trigger people to change their behaviour. For VR4REHAB, participation of actual patients and therapists was crucial. There are several ways to collect these words and activities. In one VR4REHAB group, using Post-its where participants pencilled down their motivations and trigger factors worked really well. The Post-its were collected, placed together on a wall and, in the following interactive discussion, the perceived most effective ways to influence behaviour were selected.

Phase 4: Conceptualisation

In Phases 1 to 3, we define the basic outlines of our concept(s). Phase 4 is where we begin to visualise them by creating a concept storyboard.

Why do we perform Phase 4?

Visualisation is a fundamental step in the game design process. The concept storyboard will be a key input for the stakeholder debriefing document.



Cheat Code

The stakeholder debriefing document will include a functional description of the proposed game, design sketches and stakeholder feedback.

What methods do we use in Phase 4?

Concept storyboarding

A storyboard is a planning tool for visualising and organising ideas. Ideas are pictorially or verbally represented and displayed so that they can be developed, rearranged and discussed. It's a perfect tool for people who want to organise information for proposals, presentations or productions. Using a storyboard transforms your information into a visual narrative and allows people to experiment with changes in the sequence or storyline during the creative process. Usually, a storyboard is created by an independent observer with sketching skills.

Prototype Development

Using the outcomes of the Hackathon (the harvest document and stakeholder debriefing document), we move on to Prototype Development. Prototype Development is an iterative, agile development process that uses periodical sprints and scrums. Usually, it takes place in the following format:

Duration	2 - 4 hour weekly scrum sessions with weekly sprint sessions
Number of participants	Max. 15, representing all key Stakeholders
Outputs	<ol style="list-style-type: none">1. Backlog of new ideas with potential for use in the final version of the game;2. Prototype version of the proposed game based on the organisational and behavioural changes it aims to bring about

However, the practicalities of the VR4REHAB project meant we weren't able to use this classic format. The various team members couldn't take time away from their daily work to attend weekly scrums and sprints, and were all employed at different locations. So, we designed a revised Game Jam format to achieve the same outputs from condensed sprint sessions:

Duration	2 weeks for the total number of scrum sessions (both in-person and virtual)
Number of participants	Max. 15, representing all key Stakeholders
Outputs	<ol style="list-style-type: none">1. Backlog of new ideas with potential for use in the final version of the game;2. Prototype version of the proposed game based on the organisational and behavioural changes it aims to bring about

**XP Boost**

Make sure all Stakeholders have the chance to submit feedback on the development process and outcome during each Game Jam. Base any decisions regarding developments in the next Game Jam on this feedback.

PART 1 | SECTION 3

Determining the Stakeholders and Project Partners

IN THIS SECTION

→ **Considering Stakeholders and Project Partners**

→ **Utilising Stakeholder Mapping**

→ **Formalising Partner Agreements**

Now's a good moment to take stock of where we are. We've formulated the project goal using Moonshot Thinking and we've outlined the project's fundamental themes. Now we need buy-in from key Stakeholders in order to ensure that the project is successful. To achieve this, you'll need to map your Stakeholders, then move on to bringing in your partners.

Mapping Your Stakeholders

The success of your project depends on how effectively the parties involved perceive the added value that your innovation will offer. So, first we need to ascertain which groups need to hear about this added value, loud and clear.

**XP Boost**

Different stakeholders have different wants, needs and levels of influence. Take these into account right from the start in order to effectively cultivate and leverage your stakeholder relationships.

Stakeholder mapping is essential to planning your project activities, directing these towards the right people and safeguarding a successful predicted outcome. To create your stakeholder map, follow the steps below:

1. List all the professional and/or social roles of the groups and individuals that you're likely to encounter in the course of your project
 - Listing roles, rather than individual people, allows you to generate an objective view of the situation as it stands
 - It also allows you to create a stakeholder map that's still usable in future, regardless of whether the people in those roles change

2. Rank your stakeholder list in order of priority based on level of importance/interest and level of influence/power
 - This is a key step, as it largely determines how you'll manage your stakeholders
 - High priority stakeholders are prime candidates for inclusion as project partners
 - Low priority stakeholders will likely just be kept updated once in a while

Below, you'll find an example of how to rank your Stakeholders in priority order based on these factors.

Figure 4. Stakeholder ranking based on prioritization.

		LEVEL OF IMPORTANCE/INTEREST	
		LOW	HIGH
LEVEL OF INFLUENCE/POWER	LOW	<p>LEAST IMPORTANT</p> <p>These stakeholders should be addressed via common communication channels.</p>	<p>KEEP INFORMED</p> <p>Keep stakeholders that show interest but do not have a lot of power closely involved. In healthcare, this position is often populated by the patients, as their potential benefit is high but they're not always in decision-making positions.</p>
	HIGH	<p>KEEP SATISFIED</p> <p>Opinions of stakeholders in this area might affect your project. Try to move these stakeholders into the block on the right.</p>	<p>MANAGE CLOSELY</p> <p>These are the stakeholders that can seriously influence your project's success, for better or for worse. You'll find potential key opinion leaders here.</p>

Bringing in Project Partners

Your Stakeholder Map acts as a shortlist of the key partners that should be involved in your project. The goal is to create a team of Project Partners that includes a healthy stakeholder mix:

- Several Stakeholders with high importance and high influence
- Several Stakeholders with either high interest or high influence

Now, it's time to persuade your potential Project Partners to get involved. This may be easier in some cases than others, but the fundamental rules of the game remain the same.

Potential Project Partners will come on board if they can see it will provide them with clear added value, such as:

- New knowledge insights
- New products or services
- Financial incentive



XP Boost

- In projects aiming to generate non-financial reward, the potential added value for Project Partners isn't always clear. You'll want to discuss potential Partners' needs to collaboratively identify the right reward for them.
- When you're trying to bring certain key Project Partners on board, you might need to revisit your original Moonshot Thinking to design a goal that encapsulates their objectives as well.

Once you've found your Project Partners, you can progress to confirming their involvement:

1. Compose a Partner Agreement to formalise your collaboration
 - This is formally required for subsidised projects, but it's always wise to draw up a formal agreement no matter your funding sources
 - The Partner Agreement outlines the investment each Partner will contribute to the project (in time and/or money, etc.)
2. As required, compose any additional agreements on Intellectual Property, ownership of the knowledge obtained during the project, and so on

“It was a very positive experience. I have been involved in innovation projects before but this was the first time I came across hackathons. The first one, at Sint Maartenskliniek, really opened my eyes to the possibilities of this approach – the enthusiasm and creativity was inspiring.”

— Professor Denis Martin, Middlesbrough (UK)

“There was always room for critique and a good laugh.”

— Koen van den Hurk, Nijmegen (NL)

PART 1 | SECTION 4

Planning the Overall Project

IN THIS SECTION

→ **Implementing a project-specific design process**

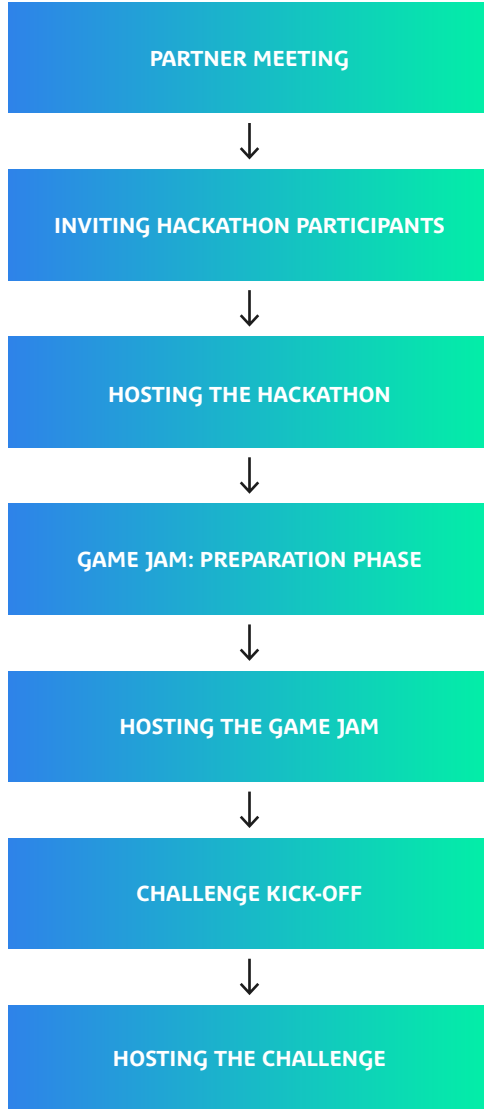
→ **Introducing the Hackathon > Game Jam > Challenge structure**

For the VR4REHAB project, we found we had to go beyond our tried and tested design process for new applications. We had to get creative, as we faced multiple challenges:

- We could only form teams from the participants who attended the initial meetings
- Team members were in full-time employment, so had limited time available
- Team members were from multiple different institutions
- Teams came from various countries

We adapted our design process to suit the situation, moving through 7 distinct stages.

Figure 5. The 7 stages of designing your innovation project.



**XP Boost**

Be sure to play close attention to the Critical Hits we've included in each of the stages below. These point out actual and potential pitfalls that we encountered in the design process, so that you can effectively avoid them.

Stage 1: Partner Meeting

All partners come together to discuss themes to be addressed in developing innovative VR applications for rehabilitation. Each partner selects a theme based on their area of expertise.

**Critical Hit**

- It's vital to define the project themes clearly during this stage, as this will help you to select the best-suited team members further down the line.
- For designing healthcare applications, Stakeholders with specific knowledge and expertise need to be included in each team (for example, you'll need a very different pool of experts for a team working on an upper limb rehabilitation game, as opposed to a cognitive rehabilitation game).

Stage 2: Inviting Hackathon Participants

Based on their defined theme, each Project Partner filmed a short video message to invite potential participants to their Hackathon. This video message acted as a motivating call to action for potential participants, challenging them to put their innovation skills to the test.

We found that several methods for acquiring participants worked well. For this purpose, we developed our own:

- VR4REHAB website
- Social media channels (Twitter, Facebook and LinkedIn)
- Word-of-mouth communication plans within Project Partners' organisations



Critical Hit

- Release your video message to encourage participation in the Hackathon at least 2 months before it's due to take place. The longer the better, really, as professionals working in the healthcare sector need advance warning to schedule time off to take part.
- Leverage different and/or additional communication channels to specifically advertise the Hackathon to SMEs and other non-healthcare Stakeholders.
- During this stage, make sure you explain the 4 Phases involved in the Hackathon to all participants, so they know what to expect.
- Make sure you accurately assess the expertise of the participants at this stage. We found that SMEs and other non-healthcare Stakeholders

lacked expertise on occasion, which impacted teams' output further down the line.

Stage 3: Hosting the Hackathon

Each Hackathon lasts 2 days, with teams formed from the participants present. After the teams have been set, they work through Phases 1 - 4 of the Hackathon.



Critical Hit

- Ensure all team members know they need to be present for the full duration of the Hackathon, rather than having team members switch in and out.
- Make sure you've scheduled in enough time for Phase 2: Moonshot Thinking, as it's vital that every team achieves a clearly defined result from this Phase. We found that 2 hours wasn't enough time for several of our Hackathon teams to develop their Moonshot Thinking, so we'd recommend a minimum of 4 hours for this Phase.



Participants during the Netherlands Hackathon trying a VR headset.

**Cheat Code**

Revisit section 2 to recap Phases 1 - 4 of the Hackathon.

Stage 4: Game Jam *Preparation Phase*

Once the teams had completed the Hackathon, we found that several needed more support in order to prepare their ideas for the Game Jam. So, we inserted the Game Jam: Preparation Phase.

**Critical Hit**

- Most often, additional support was needed due to a lack of relevant expertise or a lack of clear definition in the team's Moonshot Thinking. Check the Critical Hits for stages 2 and 3 for pointers!
- A 2-day Hackathon wasn't long enough for all teams to prepare for the Game Jam, so make sure you build in time for either a longer Hackathon, or an extra Game Jam: Preparation Phase.

Stage 5: Hosting the Game Jam

The main aim of the Game Jam is to develop a clearly-defined prototype. In healthcare terms, this prototype should be defined as a product that's ready to progress to stage 6: Challenge Kick-Off and stage 7: Hosting the Challenge. However, the prototype doesn't need to be a near-ready product, as modifications that need to be made are likely to become obvious during stages 6 and 7.



Critical Hit

- Make sure that each team is aware of the clear definition of what's expected from their prototype before the Game Jam begins.
- The Customer Journey is a key part of the Game Jam, so patient Stakeholders should be involved.
- Bear in mind that the Game Jam will need to run over at least 2 days. At the end of the Game Jam, all the teams' prototypes should be at a similar level of preparation.



Participants groups during the Game Jams elaborating the concepts to develop their prototypes, with the support of VR4REHAB clinical project partners.

Stage 6: Challenge Kick-Off

We organised an additional Challenge Kick-Off session to make sure that all the teams were at the same level in terms of their preparation, as well as to check that they were ready to take on the final Challenge.



Critical Hit

All participating teams should attend the Challenge Kick-Off session, as these types of meetings are the ideal chance to exchange experiences, tips and ideas and to create consistency in the project.

Stage 7: Hosting the Challenge

The Challenge is the teams' chance to test their prototypes with actual end users, both patients and clinicians. The Challenge is the final step before the teams can move on to developing their final product and begin the process of validating their product in clinical practice.



Critical Hit

Ensure all the teams record detailed patient and clinician feedback from the Challenge. This is vital for shaping their future Business Plan, as themes such as usage time (number of patients that can use the game per day), unforeseen additional requirements for resources and implementation, and so on could come up.



Teams working on the feasibility tests – evaluating the interaction between the application, patients, and therapists.

TIME TO LEVEL UP!

PART 2

Preparing for Your Innovation Project

IN THIS PART

→ The aim of pre-project preparations

→ Attracting Stakeholders and Project Partners

→ Rallying your project teams around an innovation theme

PART 2 | SECTION 1

The Goal of the Preparation Phase

IN THIS SECTION

→ **Setting project expectations to streamline collaboration**

→ **Establishing a productive project mindset**

In order to form effective, lasting and mutually beneficial relationships with your Stakeholders and Project Partners, everyone needs to know what they can expect from the project in advance. We found that expectations and aims regarding the project differed across our Stakeholders; this will likely be the same in your case.

So, to later set out actionable objectives and establish reasonable expectations, it's vital you know where all your Stakeholders are coming from. We'd recommend sending out pre-project questionnaires to your Stakeholders, including questions that will give you detailed information about:

- Stakeholder areas of expertise
- Stakeholder expectations
- Stakeholder commitment
- Stakeholder potential for long-term involvement

This questionnaire can also help to build up Stakeholders' investment in the ideas behind the project and its groundbreaking potential in the healthcare innovation space. We'd suggest including questions that encourage participants to:

- Increase their awareness of the project's importance and relevance
- Adopt a suitable mindset for embarking on the project

We found that the ideas Simon Sinek outlines in his book *Start with Why* are helpful for forming the basis of these pre-project questionnaires. When formulating your questions, ensure they're encouraging your potential participants to consider the following factors:

- Why does this project exist?
- Why should I want to participate?
- What is this process going to consist of and am I capable of completing it?
- How can I contribute to this process?
- What will the project's contribution be, specifically to healthcare and in a more general sense?
- What will I gain from the project, both short-term and long-term?



XP Boost

You can use the questions you include in these pre-project Stakeholder questionnaires, as well as the information you gain from them, as reflection prompts during and after the project.

PART 2 | SECTION 2

Structuring Your Preparation Phase

IN THIS SECTION

- **Bringing in Stakeholders and Project Partners with a captivating Moonshot**

- **Forming your project teams**

- **Selecting your innovation topic**

This Section will walk you through preparing for the first event in your innovation Phase, the Hackathon.

Sharing Your Moonshot

Before you can begin your innovation process, you'll need to reel in Stakeholders and Project Partners by inspiring them with a clear innovation goal and vision of how they can use their technical expertise to collaborate on a truly game-changing development. This involves:

1. Clearly defining the overall Moonshot of your project
2. Sharing this Moonshot idea with potential project participants

By defining and sharing your overall Moonshot with potential Stakeholders and Project Partners, you can generate more relevant interest in your project and provide a clear basis for Stakeholder and Project Partner expectations.

**Cheat Code**

In our case, we described our overall Moonshot in the VR4REHAB application but didn't include it in the invitation we sent out to potential participants. We'd recommend ensuring you communicate your overall Moonshot idea directly to all potential participants that you contact, as this is the clearest way for them to see the potential added value the project represents for them. Ultimately, this should help to bring in more Stakeholders and Project Partners.

Forming Teams

Forming the right team is key to success in any innovation process. You need the right mix of knowledge and expertise, high levels of collaboration and interaction and a healthy dose of inspiration and creativity.

To ensure you build a bona fide A-Team, we'd suggest following the process below:

1. Start the innovation process with a pre-assembled team, or at least several core members that you can build the rest of the team around
2. Use potential participants' answers to the pre-project questionnaire to identify gaps in your team's knowledge and expertise

3. Use potential participants' questionnaire answers to seek out the support, expertise and Stakeholders you need to plug any gaps in your team
4. Leverage the process of finding additional expertise to round out your team's capabilities to:
 - Encourage team building
 - Clarify participants' expectations relating to the project and the rest of their team
 - Foster participants' understanding of the innovation process
 - Cultivate participant commitment

**XP Boost**

Holding an opening session for all project participants where they can discuss their vision for the project is an effective way to boost commitment to the project, share ideas and expertise and facilitate the innovation process.

**Critical Hit**

Forming a team of people with complementary skills and the ability to work well together is more often than not the defining factor in a project's success or failure.

“I’ve participated in many projects over the years and this has been one of my favourites. The international dimension adds to the whole experience. It’s always fascinating to see how things are done in different places. A positive aspect was working with colleagues from different disciplines to mine. A negative was how COVID brought an abrupt stop to some of our plans.”

— Professor Denis Martin, Middlesbrough (UK)

Pitching Ideas

In order to find the right team members to help you launch your Innovation Project and see it succeed, you’ll need to clearly articulate and share the problem you’re aiming to solve, as well as your ideas for solving it.

To do this, organise a pitch session where participants present their ideas and respond to the following questions:

- How and why have you come up with your idea?
- What makes it innovative?
- How are you planning to make your innovation a reality?
- What are you aiming to achieve with your innovation?

**XP Boost**

Establish a panel or jury to fairly select the best idea for your Innovation Project. The jury should also leverage its expertise to highlight potential obstacles to the project's success.

The jury should - at a minimum - contain members with the following expertise:

- Business development
- Investment/startup needs
- (Para)medical background, working with actual patients
- Patient representative
- Design/gamification

Using their combined expertise, the jury members will be able to put their finger on any “sore spots” in the teams and their design processes.

**Critical Hit**

It's essential that the panel or jury points out possible challenges in the innovation process to give participants a clear idea of the level of commitment and perseverance required.

Upping Your Game

Once you've moved through all the processes described above, you'll have a set of teams primed to enter the innovation process with a clear shared goal in mind. Now, it's time to up each team's game in order to boost their innovation potential as far as possible.

So, it's time to talk strengths and weaknesses. Each team will surely bring a hefty amount of expertise to the table, but it's still key to outline:

- A list of each team's expertise gaps or shortcomings
- A list of actions to overcome these gaps or shortcomings before the Hackathons
- A clear timeframe to address each team's shortcomings
- A summary of additional education and/or training that each team needs
- A clear timeframe for holding the Hackathons



XP Boost

Plugging the expertise or knowledge gaps in each team with additional education and/or training is a prime opportunity for personal and professional development. For many participants, this could represent a key non-financial reward of the project.



Critical Hit

Ensure each team schedules in clear, achievable timeframes for overcoming shortcomings and organising its Hackathon.

“I am generally allergic to meetings, but thanks to the team that was created it wasn’t just about work, it was a stimulating and fun environment.”

— Professor Denis Martin, Middlesbrough (UK)

PART 3

Hosting a Hackathon

IN THIS PART

- Planning and preparing for your Hackathon

- Supporting participants during the Hackathon event

- Wrapping up the Hackathon and priming the Game Jam

PART 3 | SECTION 1

Setting Your Hackathon Goal

IN THIS SECTION

- **Introducing the Hackathon method**

- **Strategically inviting Hackathon participants**

- **Assessing participant expertise to streamline innovation**

It's vital to outline clear goals for your Hackathon, as well as for the project as a whole, to ensure all your participants are on the same page and moving towards a coherent and relevant end result. Recapping why we're using the Hackathon method is also a useful tool for defining our Hackathon goal.

Why do we use Hackathons?

- To create a space allowing ideation of all possible solutions to a defined problem
- To support participants to divert from familiar thought pathways
- To generate concepts and ideas that truly challenge existing assumptions
- To challenge participants to move beyond their intellectual comfort zone
- To produce truly novel ideas



XP Boost

It's vital to cultivate a Hackathon space where all participants feel welcome, confident and comfortable to share their thoughts and ideas. The more ideas the better at this stage, as you'll narrow the scope further on in the innovation process.

Sending Hackathon Invitations

Once you've set a clear Hackathon goal, you'll be able to invite participants. Your Stakeholder Map is a key tool for planning out the participants you invite to take part in the Hackathon, as you should aim to include Stakeholders with a variety of roles.

Your Hackathon invitations should clearly outline what the added value for each participant will be in order to generate interest and encourage sign-ups. For example, patients might want to participate if

they can appreciate the game's potential for supporting and improving their rehabilitation process. Medical professionals are more likely to participate if you help them visualise a more efficient, VR-based future for their rehabilitation department. SMEs and non-healthcare professionals are more likely to come on board if you're able to describe the groundbreaking potential of your project in business terms.



XP Boost

Tailor your invitations to each target participant group in order to generate as much interest as possible.



Critical Hit

Your Stakeholder Map lists the professional and/or social roles of the groups and individuals that you're likely to encounter in the course of your project, ranking them in priority order based on their level of importance/interest and level of influence/power.

Gauging Participant Experience

It's highly likely that the participants you have lined up will have differing levels of Hackathon experience. Some might be Hackathon veterans, while others might be totally new to the concept.

Due to this range of experience, you'll likely need to outline the thinking behind the Hackathon structure when you communicate with participants before the event. That way, they'll know what they need to bring to the Hackathon table and what they can expect to achieve by the end of the event.



Critical Hit

Make sure that participants with no previous Hackathon experience feel welcome and supported throughout the innovation process. This is vital to ensuring that your project benefits from an optimal range of innovative inputs from all the relevant professional and social sectors.

PART 3 | SECTION 2

Structuring Your Preparation Phase

IN THIS SECTION

- **Inspiring your teams with the right Hackathon Moonshot**

- **Supporting Stakeholders with wide-ranging expertise**

- **Drafting Business Plans**

- **Introducing the Business Model Canvas**

- **Implementing team building and managing participant expectations**

From Moonshot Thinking to kick off your Hackathon all the way to practically outlining participant expectations, this is your Hackathon preparation toolkit.

Starting with Your Moonshot

Sharing your Moonshot Thinking at the start of the Hackathon event sets the scene for the project and ups the innovation ante on the day. In fact, you'll want to start the day by sharing a couple of Moonshots with the Hackathon participants: the Hackathon Moonshot and the overall project Moonshot.

Each Moonshot respectively outlines the ultimate goal of the Hackathon and of the entire project. As such, the Hackathon Moonshot represents a fraction of the overall project Moonshot, as it's one step of the whole project process. To clearly present the various Moonshots on the day of the Hackathon and get all your participants inspired and raring to go, follow these steps:

1. Present the overall project Moonshot right at the start of the Hackathon event

An inspiring format is the best way to present an inspiring idea. Think big: what's the best way to present your overall project Moonshot in all its game-changing glory?

2. To follow on, distil the overall project Moonshot down to your more specific Hackathon Moonshot

The Hackathon Moonshot will depend on the time available for the teams to work on their ideas, as well as the complexity of the problem they're trying to solve

3. Allow each team of participants to set their personal goals for the Hackathon based on the Moonshot

**XP Boost**

The Hackathon Moonshot should always be ambitious, with scope for the participants to think and work as creatively as they can.

Supporting Participants in Problem Definition and Ideation

As we know, our Hackathon teams are likely to have a wide range of areas of expertise, as well as differing levels of Hackathon and innovation experience. So, we'll need to support every member of every team through the Hackathon process as needed.

Providing this support will help to ensure participants remain motivated and committed to the project, enhance the quality of the ideas generated and bring all the teams to the same level of progress by the end of the Hackathon event.

The support available should be specifically directed at helping the teams to achieve their Hackathon goals. We suggest focussing on 2 Support Areas:

- 1. Problem Definition**
- 2. Ideation**

Support Area 1: Problem Definition

What is Problem Definition?

Problem Definition is a user-centred process that accurately describes the situation in which the user finds themselves when they're faced with the specific problem we're attempting to solve.

How can we support effective Problem Definition?

[Use tools such as stakeholder mapping and empathy mapping](#)

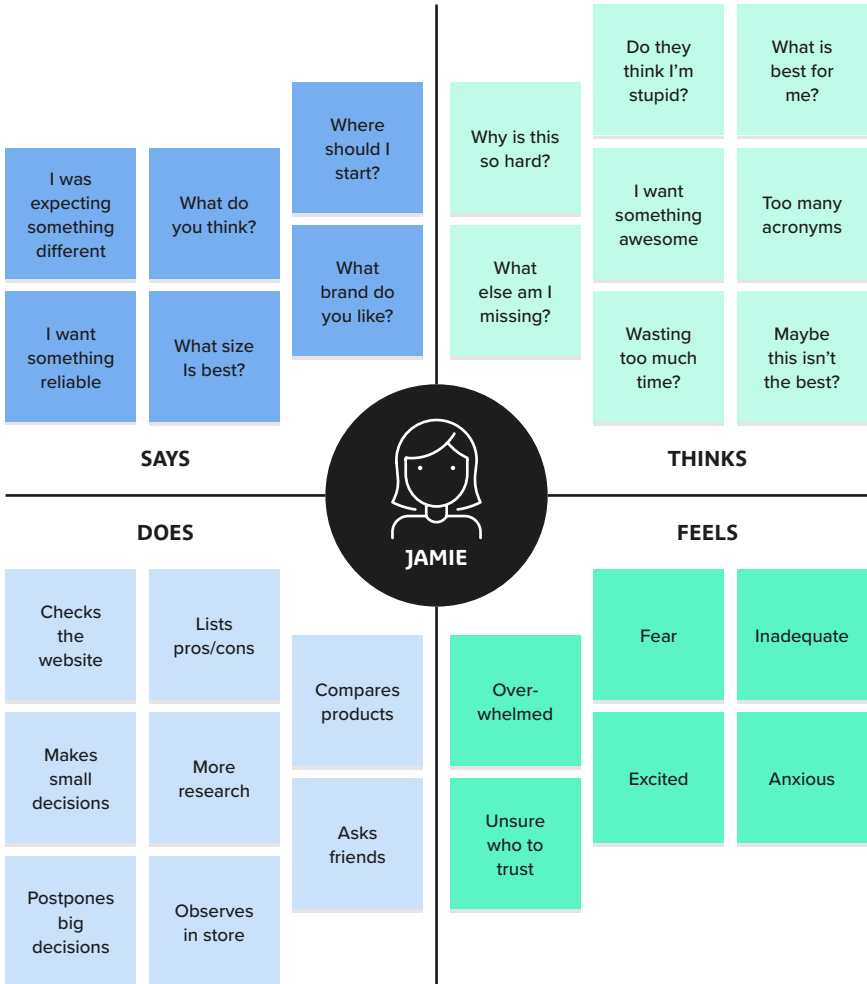
Stakeholder mapping outlines all the Stakeholders connected to the problem, while empathy mapping details the related actions, thoughts and feelings of the user.



XP Boost

You can use your Empathy Map to generate a User Persona for an imagined individual that will benefit from you solving your target problem. A User Persona can inform your Business Plan and help challenge and test the ideas the team comes up with.

Figure 6. An example of an empathy map.



Support Area 2: Ideation

What is Ideation?

Ideation is an iterative process in which assumptions generate new insights, which in turn influence our assumptions, which then lead to further insights, and so on. Ideation is a virtuous circle leading to consistently improved ideas.

How can we support effective Ideation?

- Ask “How might we...?” questions
- Describe the worst possible idea to find its inverse
- Set certain creative constraints rather than leaving the session totally open-ended
 - Ensure you sketch out the goal of the creative session, so participants are clear on what they’re expected to achieve
 - Canvas tools (such as a Business Model Canvas) can act as a useful steering aid
- Channel the process based on your solid Stakeholder Map and Problem Definition



Cheat Code

You’ll find detailed information on introducing and utilising a Business Model Canvas later on in this Section.



XP Boost

It’s vital to encourage all participants to share any and all ideas they have with their teams during the Ideation stage. There are no wrong answers here!

Writing the Business Plan

Ultimately, the overall goal of the Innovation Project is to design a concept that sustainably solves your target problem. With emphasis on sustainably.

By considering a solution's business potential early on in the innovation process, we increase its chance of future success. So, cost-effectiveness is a vital factor to consider when we're selecting which innovative ideas to pursue. If an idea solves the problem but doesn't do so cost-effectively, it's unlikely to attract investment, sell successfully or reach significant numbers of end users.

Just like Ideation, writing a Business Plan is an iterative process that's based primarily on assumptions. It's impossible to create an airtight profit and loss forecast for when you launch your product on the market, but it's helpful to write up a first draft of your Business Plan that will develop as the project progresses.

At a minimum, your Business Plan should include:

- Your Problem Definition
- A product description
- A value proposition
- Details about your team
- Market research
- An outline of your business model

**XP Boost**

Drafting your Business Plan will help the teams consider their idea from a new perspective. It's important to bear in mind that, particularly in healthcare, the end user isn't always the person or organisation that will purchase a product or service.

Using a Business Model Canvas

When it comes to crafting their Business Plans, your teams could find a Business Model Canvas incredibly useful.

Essentially, a Business Model Canvas is a strategic management template that can be used for developing new business models (or for documenting existing ones). It's a visual chart that contains sections describing the value proposition of a given product or company, as well as its proposed or existing infrastructure, customer base and financial framework.

However, in order to make the best use of a Business Model Canvas tool, your teams will need to understand the ins and outs of how they work. So, if they're not already familiar with the concept, they'll need to get to grips with it before - or during - the Game Jam: Preparation Phase.

There are 2 options for ensuring your participants have all the information they need to effectively leverage a Business Model Canvas.

1. Ensure participants read up before the Game Jam: Preparation Phase

2. Have business experts on hand throughout the Game Jam: Preparation Phase

Option 1: The read-up

On the one hand, you could provide your participants with reading materials so that they can come to the Game Jam: Preparation Phase prepared. If you opt for this route, we'd recommend directing all the participants to the Strategyzer site. From there, they can watch *Strategyzer's Business Model Canvas Explained introduction video*, as well as explore further resources.

Option 2: Experts on hand

Alternatively, you can ensure that you have business experts on hand throughout the Game Jam: Preparation Phase. These experts will walk the teams through using a Business Model Canvas to develop their product planning, as well as answering any questions they have throughout the event.

To give your teams the best chance of maximising the Business Model Canvas potential, we'd recommend going for Option 2 (although combining this with Option 1 wouldn't hurt, of course).

As we'll see later on, it's vital to have business development experts around to advise the teams from the Game Jam stage onwards. So, bringing them in for the Game Jam: Preparation Phase is no great leap!

Team Building and Managing Expectations

The key benefit of assembling multidisciplinary teams for innovation processes is, in fact, the variety of ideas and opinions that the team will generate. But, at the same time, these differing interpretations and ambitions could lead to tensions following the Hackathon, if not managed diplomatically.

Effective team building and managing participant expectations are, therefore, vital components of following up after the Hackathon. Ultimately, investing time and thought into team building and managing expectations will shore up your project's potential for ongoing success.

Developing the idea the team devised in the Hackathon into an actual, tangible product will require high levels of work, commitment and investment (in terms of time, intellect, funds, etc.). It's vital that each team is on the same page when it comes to these expectations, as well as potentially sensitive subjects such as who will officially own the final product.



XP Boost

Avoiding complications is often as easy as starting open conversations on these topics at an early stage. This could form part of the Business Plan drafting process, as the decisions you make will affect its content.

PART 3 | SECTION 3

Supporting Hackathon Participants

IN THIS SECTION

→ Supporting your Hackathon teams with on-hand multi-sector expertise

Your Hackathon teams will consist of participants from a wide range of backgrounds and knowledge levels, from SME entrepreneurs to clinicians, to avid gamers and rehabilitation patients.

Some will come in with more Hackathon experience than others, but even the veterans might come across topic areas they've never delved into during this particular Hackathon. So, it's wise to have support on hand to guide the event along.

Support Area 2: Ideation with Design Thinkers

Support Area 3: Business Planning with Experienced Entrepreneurs

Support Area 4: Generating Novel Concepts with IP Experts



Cheat Code

Refer back to Part 3, Section 2 for information on Support Area 1.

Support Area 2: Ideation with Design Thinkers

It's important that the teams stick to their Ideation for as long as needed to generate a truly novel and insightful idea, without jumping (even subconsciously) to predictable conclusions.

Experts in Design Thinking could coach the teams by suggesting tools and methodologies to keep their creative juices flowing and posing open questions to encourage and optimise their innovation process.

Support Area 3: Business Planning with Experienced Entrepreneurs

Creating a Business Plan is likely to be a new concept for some members of each team, meaning they'll appreciate guidance in this area.

Providing each team with a standard Business Plan template will help them get their footing and ensure a base level of output consistency across the teams. Experienced entrepreneurs could explain the various aspects of a Business Plan to the teams, providing tips during the writing process.

Each team's Business Model Canvas will also provide key input for writing up their respective Business Plans.

The teams' innovative ideas might even call for innovative business models, in which case the teams can collaborate with experienced entrepreneurs to formulate new facets of their Business Plan based on current applicable standards.

Support Area 4: Generating Novel Concepts with IP Experts

Coming up with new ideas with the aim of developing them into a new product, service or concept inherently creates Intellectual Property (IP).

Having an IP expert on hand throughout the Hackathon process can support your teams to open up discussions around the future ownership of IP and how to manage this theme as their innovation processes progress.

It's not necessary to dive into the details of the various ways of applying for IP at this early stage, as the teams will cross that particular bridge when they come to it. That said, highlighting the topic of IP right from the get-go can facilitate its management further down the line.



XP Boost

Encourage your facilitating experts to introduce themselves and their professional specialities with presentations to all the teams at the start of the Hackathon. That way, the teams will know who to turn to when questions come up during the event.



Critical Hit

Keep efficiency and motivation high, and frustration low, by having experts wander around the teams throughout the Hackathon so their expertise is equally distributed.

PART 3 | SECTION 4

Structuring the Hackathon and Preparing for the Game Jam

IN THIS SECTION

→ **Timetabling a smooth-running Hackathon**

→ **Hackathon deliverables**

This Section outlines a step-by-step suggested timetable for your Hackathon event, to ensure it runs smoothly and your teams have the time they need to get their innovative juices flowing, as well as to deliver the expected Hackathon outputs.

Timetabling the Hackathon

Based on our own experience with VR4REHAB, we'd recommend structuring the 2-day Hackathon event as follows:

Time	Activity
17:00	Registration & VR Market
17:30	Dinner
19:00	Hackathon Opens
19:30	Introduction of Themes
20:30	Break
20:45	Pitching of Problems
21:30	Formation of Teams
21:30	Closing Drinks & Networking

Time	Activity
08:30	Start
08:40	Inspiration Session
09:00	Tools & Methods I
09:30 - 24:00	Start Hacking!
<i>Meanwhile:</i>	
09:00	Coach Training & Briefing
10:00 - 12:00	Coaching Sessions
13:00	Lunch
13:30	Tools & Methods II
15:00	3-Minute Progress Pitch
18:00	Dinner
24:00	End

Dutch hackathon at the Sint Maartenskliniek.





Preparing for the Game Jam

Hackathon, hacked! By the time your Hackathon event wraps up, make sure all your teams have come up with the following:

- A solution concept
- A Business Plan draft
- A list of their next steps in the innovation process, to be developed in the Game Jam
- A list of any questions the team has, plus any areas in which they feel they need support

The next step for your teams will be moving on to the Game Jam stage.

PART 4

Gearing Up for the Game Jam

IN THIS PART

→ Planning your Game Jam

→ A detailed look at Game Jam requirements

→ Supporting your teams throughout the Game Jam event

→ Setting the Game Jam deliverables

PART 4 | SECTION 1

Planning Your Game

IN THIS SECTION

- **Introducing the Game Jam**

- **An overview of prototyping**

- **Structure of the Game Jam**

- **Prioritising the Customer Journey**

The Game Jam is an iterative process, the goal of which is to develop the concepts the teams designed during the Hackathon into prototypes. At this stage, the prototypes can be any kind of working model of their concepts.

What is prototype for?

- To test the concept in practice, to see if it delivers the desired effect
- To test whether the concept is feasible
- To incorporate fundamental features into a Minimum Viable Product (MVP)
- On occasion, to present an on-paper working model to future users

**Critical Hit**

Your teams should ensure that major modifications can still be made to their prototypes, without incurring major costs or requiring a complete redesign. The prototypes should also align with the project Moonshot and Hackathon Moonshot.

What Happens During the Game Jam?

The Game Jam is split into short sprint sessions, following the outline below.

- **Step 1: Prototype design sprint**
The teams spend 2 - 3 high-focus hours designing their proposed prototype.
- **Step 2: Prototype testing**
At the end of the design sprint, the teams test their prototypes as they stand.
- **Step 3: Prototype presented for feedback**
Following the testing phase, the teams present their prototypes to the other teams involved in the Game Jam, as well as to all the project Stakeholders, to receive feedback across the board.
- **Step 4: Feedback integrated into next prototype design sprint**
The teams take all the feedback they receive on board, utilising it to improve and adapt their prototype during their next design sprint.



Repeat

Steps 1 - 4 are repeated 4 times over 24 hours across the full Game Jam runtime. With motivated participants, continuing work in the evening shouldn't be a problem!



Critical Hit

It's vital that patients and medical professionals are well-represented within the group of project Stakeholders who are able to give feedback on the teams' proposed prototypes. This is due to the importance of the Customer Journey in healthcare product development. The Customer Journey is, in fact, the interaction between medical professionals and actual patients. Medical professionals have to gain an understanding of how a patient will experience a concept's design. For example, if patients show resistance to a concept, or difficulties using it, then the concept is doomed to fail in its marketing phase. So, any kind of resistance has to be clearly voiced right from the start.

The Importance of the Customer Journey

In healthcare in particular, proactively considering patient experience and the Customer Journey is vital to developing top quality, highly effective and widely usable products.

When requesting and receiving feedback from both patients and medical professionals, it's important that the Game Jam teams consider the following key questions:

1. How will future users (patients) experience their product?
2. How will medical professionals experience their product?
3. Will patients be motivated to use their product?
4. Will medical professionals be prepared to integrate their product into their daily practice?



XP Boost

In reality, the Customer Journey is the Moonshot for the Game Jam phase. Encourage your participants to think along the above lines, to avoid any future resistance in practice from both patients and medical professionals. You have to make sure they will get wholeheartedly behind the concept, in order to achieve full acceptance and successfully market it!

“Although it wasn’t always sure where the project was going, everybody kept working. This energy was really enticing.”

— Koen van den Hurk, Nijmegen (NL)

PART 4 | SECTION 2

A Detailed Look at Game Jam Requirements

IN THIS SECTION

- **Fleshing out your teams with internal and external expertise**
 - **Designing Challenge-ready prototypes**
-

At this stage of the project, the technical know-how you provide on the ground to support your participants is key. It's also crucial that your teams' prototypes fit various criteria in order to proceed to the Challenge phase. Below, we'll take a detailed look at both of these areas.

Team Requirements

In the steps of the project leading up to the Game Jam, having programmers and/or coders present was advisable, but not required. For the Game Jam, though, it's vital that you have programmers and/or coders on hand.

This is because their expertise will facilitate bringing participants' ideas to life, in terms of the software required. Having programmers and/or coders present to collaborate with Game Jam participants on their ideas will ensure that good thinking isn't dismissed simply because the

participants ideating the products don't personally have the technical know-how to devise the software required.

It's also vital to have future potential product users present for the Game Jam stage, from patient and medical professional Stakeholder groups. This will support the teams to focus on the Customer Journey, as well as allowing participants to hear real-time patient feedback on the ideas they're developing.

In particular, patients and participants should be encouraged to give and request feedback on:

- Their product's User Interface (UI)
- The applicability of their product in daily practice
- Any potential specific environmental requirements within a healthcare setting



Cheat Code

Head back to Part 1, Section 3 to review your Stakeholder Map.



XP Boost

We'd also recommend having one or more medical technicians on hand during the Game Jam, as they'll be able to support your teams in ensuring their prototypes comply with all the relevant technical healthcare standards and regulations.

Prototype Criteria

Each team's prototype must be a version of their product that can be used in medical practice, either within a hospital setting or at the patient's home. It goes without saying that this prototype also has to align with the overall project Moonshot.

Whatever kind of prototype your teams come up with, it has to fit certain key requirements. In a nutshell, the prototypes must:

- Comply with applicable medical regulations
- Comply with applicable clinical testing regulations (both ethical and practical)
- Enable the efficacy and efficiency of the product to be tested in practice
- Enable product feasibility testing in hospitals or at patients' homes
- Be sufficiently self-explanatory to be able to be used in practice
- Include clear objectives for their proposed intervention
- Have clear parameters set to analyse prototype effectiveness



XP Boost

Leveraging the expertise of the potential product users (patients and medical professionals) and the medical technicians on hand during the Game Jam will help teams to ace these prototype criteria.

PART 4 | SECTION 3

Supporting Game Jam Participants

IN THIS SECTION

→ **Providing sector-specific support during the Game Jam**

→ **Addressing key business development questions**

As we've seen, it's important that you have programmers and/or coders on hand to support your teams during the Game Jam, as well as medical technicians who are primed to advise on applicable standards and regulations. Patient and medical professional representatives should also be present.

Aside from those specific knowledge bases, we'd recommend that you keep these experts on hand to advise your teams as needed:

- Design thinkers
- Creative designers and/or art designers
- Experienced entrepreneurs
- Concept developers
- Intellectual Property (IP) experts
- Financial experts
- Healthcare business development experts
- End users
- All other project Stakeholders

**Cheat Code**

- Revisit Part 3, Section 3 for in-depth explanation of the expertise and support that design thinkers, entrepreneurs and IP experts can provide for your teams.
- Flick back to Part 1, Section 3 to recap your Stakeholder Map.

The Importance of Healthcare Business Development Expertise

During this stage of the project, it's particularly important to bring experts in this area on board. They'll be able to guide your teams towards producing the best possible product prototypes and their accompanying draft Business Plans.

The option to consult experts in business development for healthcare will come in especially handy as the Game Jam participants are faced with making decisions that will significantly impact the cost of their proposed product, as well as how and where the product will be used.

When requesting input from the healthcare business development experts on the ground during the Game Jam, the teams should take into account the following key questions:

1. Will their product fit into the current healthcare reimbursement system?

2. If not, who is - or would be - willing to pay for their product? Potential funders could be patients, hospitals, healthcare insurers, or the government.
3. Will their product replace existing applications in a process of substitution, or will it be an “add-on” application instead?
4. Will their product lead to short- or long-term cost savings? For example, their product might impact patients’ Daily Activity Living Years (DALY) scores.

Preparing for the Challenge Kick-Off

After the Game Jam comes the penultimate stage of the project: the Challenge Kick-Off. To ensure they’re ready to move on to this event, your teams should finish the Game Jam with the following prepared:

- A product prototype that meets all the criteria detailed previously
- A draft Business Plan



Cheat Code

Head to Part 4, Section 2 to recap the list of prototype criteria.

Above, we took a detailed look at the importance of having healthcare business development experts on hand to assist your teams in developing not just their proposed prototypes, but also the accompanying draft Business Plans.

The teams' draft Business Plans will need to consider the 4 key business development questions outlined earlier, as well as the questions below:

1. What does the current market look like, particularly in terms of segmentation and number of patients?
2. What is their product's market potential? This should be based on whether their product will function as a substitute or an "add-on", or fall under another classification.
3. Will their product only serve the national market, or are they intending to export it?
4. How will they bring their product to market? Potential methods could be direct, via distributors, or through collaborating with external suppliers.
5. How is their company set up, structurally and legally?
6. Who are their business partners?
7. Do Intellectual Property (IP) regulations apply?
8. What are the risks and opportunities involved in launching their product?
9. What are their product's strengths and weaknesses?
10. Are they planning to develop their product further? For example, this might be just the first stage in a range of further innovations.
11. Are there investors and/or funders on board to cover the costs of developing the final product?

**Critical Hit**

Your teams will only be able to properly address this final, crucial question of locking in adequate investment and funding once they have a proper Business Plan prepared.

Now, it's time to take things up a gear. After jammin' through the Game Jam, your teams will be set to take on the ultimate Challenge.

TIME TO LEVEL UP!

PART 5

Who's Up for a Challenge?

IN THIS PART

- **Transitioning from Challenge Kick-Off to Challenge**

- **Challenge Kick-Off: from workshops to round-up**

- **Providing expert support throughout the Challenge Kick-Off**

- **An outline of Challenge Kick-Off deliverables**

PART 5 | SECTION 1

Moving Towards the Final Challenge

IN THIS SECTION

→ **Aims of the Challenge**

→ **Challenge Kick-Off to Challenge: an overview**

The Challenge is your teams' opportunity to test their proposed concepts in practice, trialling their efficacy and useability in real-life scenarios. These tests will be carried out in laboratory settings at clinical practices, with both patients and medical professionals.

What are we aiming for with the Challenge?

- To gain insights into the interaction between patients, medical professionals and the teams' VR technology prototype concepts
- To check the feasibility of these prototype concepts
- To test the prototype concepts' technical performance
- To check the prototype concepts' User Interfaces (UIs), in terms of both practicality and performance
- To record patient experiences, with particular focus on prototype efficacy and patient adherence to regular usage
- To record medical professionals' experiences, with particular focus on prototype efficiency

The teams should document all the insights they gain in the Challenge phase in a detailed report. Based on these learnings, they may need to make modifications to their product.



XP Boost

The teams will use the insights they gain during this stage as a key tool for developing the final design of their product.

From Challenge Kick-Off to Challenge

Before the final Challenge can begin, it's important to bring all your teams together for a Challenge Kick-Off session.

In essence, the Challenge Kick-Off is your teams' final check before they head into the last phase of the project, the Challenge. As such, it's vital they take a global approach to reviewing their product before it's used in practice during the Challenge itself.

To achieve this, we'd recommend structuring the Challenge Kick-Off session around a series of wide-ranging themed workshops. It's also vital to have the relevant expertise on hand to support and guide your teams towards optimising their product as far as possible (more on that later).

In brief, the Challenge Kick-Off workshop series should cover:

- Gameplay & Design
- Prototype Development
- Technical Solutions
- Drafting a Research Plan
- Dissemination
- Legislation
- Marketing & Sales
- Management & Funding

In the next section, we'll dive into detail on the ideas behind the Challenge Kick-Off, as well as the workshops and experts involved.

PART 5 | SECTION 2

The Challenge Kick-Off

IN THIS SECTION

- **Why do we start with a Challenge Kick-Off?**

- **Structuring the Challenge Kick-Off workshops**

- **Why attending the Kick-Off is key for success**

- **Supporting your teams throughout the Kick-Off**

- **Preparing for the final Challenge**

The Challenge Kick-Off is an essential step to ensure that all the teams are equally prepared to move on to the Challenge.

The main aim of the Challenge Kick-Off is, therefore, to ensure that all the teams are on an equal footing before the Challenge begins. To achieve this, every team needs to attend the Challenge Kick-Off session.

The learnings each team takes from the Challenge Kick-Off workshops, as well as the following round-up steps, will determine any modifications, planning, research, and so on that they might need to carry out before the Challenge begins.

To begin, we'll walk through organising your series of Challenge Kick-Off workshops.

Organising Your Challenge Kick-Off Workshops

Across the Challenge Kick-Off session, your teams will be considering a broad range of themes that are vital to the success of their product.

On that note, let's talk workshops. Each workshop will address a particular theme, ranging across creative, technical, investigative, legal, commercial and financial topics.

Here, you'll find a compilation of our recommended workshop categories, as well as the key questions each should address.

Gameplay & Design

- What is their game about?
- How was it designed?
- What about their game makes people want to continue playing?

Prototype Development

- Does their prototype comply with the Challenge requirements?
- If not, what adjustments need to be made?

Technical Solutions

- Are the technical solutions they've chosen feasible for practical implementation?
- Which technical challenges are they facing?
- How can those challenges be solved?

Drafting a Research Plan

- What will the team be investigating in the research phase?
- Has the team considered the following essentials?
 - Is approval from a Medical Ethical Committee (MEC) required?
 - How much time is needed for this phase?

- Who will be involved in the research phase?
- What are the inclusion and exclusion criteria for patients during this phase?
- How will drop-outs from the research phase be handled?
- Can the game be integrated into daily therapy, or is a test setting required?
- What are the outcome parameters (end-points) for the research phase?
- Which statistics will be used?

Dissemination

- How will the team make its results public?
- Which media/papers/publications do they anticipate using to disseminate their results?

Legislation

- Does their prototype concept comply with current and future legislation?



XP Boost

Here, it's vital to bear in mind the Medical Devices Regulation (MDR, 2020), the General Data Protection Regulation (GDPR, 2016) and potential requirements for approval from a Medical Ethical Committee (MEC). In particular, the latter will require a substantial amount of time, so may push back starting the Challenge.

Marketing & Sales

- Has the team thought about how to bring its game to the market?
 - On this theme, has the team considered licence agreements, direct sales, or selling to third parties?
- How does the team plan to finance its strategy?

Management & Funding

- How will the team organise the distribution of its game?
- How will this process be organised?
- How will the teams arrange funding?

After the workshops are completed, you'll be ready to move on to the Challenge Kick-Off's succinct round-up process. The aim here is to give each team time to process their own learnings, as well as to share these with all the other teams and experts present.

We'd recommend the following steps:

- **Step 1: The learnings pitch**

Each team presents the learnings they've gained during the Challenge Kick-Off session to all the other teams, as well as the supporting experts on hand for the Challenge Kick-Off (you'll find more detail below).

- **Step 2: The action list**

The pitch audience as a whole - all the teams and experts - collaborate to create a list of action items for each individual team. This will be based on what both the teams and external experts learn about each team's progress from their learnings pitches.

— Step 3: The Digital Dashboard

As the project organiser, you'll provide a Digital Dashboard where each team can list the action items it needs to carry out to prepare for the Challenge. This could be as simple as setting up a shared Doc on Google Drive where you and your teams can continually log progress.



XP Boost

The Digital Dashboard is a key project management and timeline monitoring tool for you, the project organiser, as your participants move towards the final Challenge. It's also a resource the teams can access to check in on the actions required to be ready for the Challenge phase and to keep each other updated.

The Challenge Kick-Off workshops are a rich resource for developing each team's knowledge and insights, as well as a key opportunity to significantly hone their product. As a result, it's vital that each member of each team makes it to the Challenge Kick-Off.

Below, we'll dive into more detail on the importance of full-cohort attendance, as well as practical recommendations to streamline your workshop scheduling.

Why Challenge Kick-Off Attendance is Crucial for Success

For the Challenge to have the best possible chance of being an all-out success, it's crucial that all your participants attend the Challenge Kick-Off session.

The reason for this is that the Challenge Kick-Off is their final opportunity to address all aspects of their proposed product's design. As a result, the Challenge Kick-Off is a real team effort moment, to decide on the final look, feel and function of their product before it heads into the final Challenge phase.

For example, if the team discovers it needs to make an adjustment to the product's User Interface (UI), they might then need to make changes to its underlying code or creative design.

If the team realises it needs to make alterations from a therapeutic point of view, they'll need medical professionals, designers and coders to advise on the technical options available, as well as general feasibility.

Or, if approval from a Medical Ethical Committee (MEC) seems relevant, a research/ethical expert in combination with a medical professional should be prepared to write the application and estimate the time needed to process the approval.



Critical Hit

The Challenge Kick-Off is a truly collaborative effort. All the members of each team should attend, to optimise their product as far as possible before the Challenge begins.

To keep the time needed for the Challenge Kick-Off to a minimum, we'd recommend organising parallel workshop sessions. Running parallel workshops means the team members will need to split up and each

**XP Boost**

Ideally, the team members will attend the workshops that best align with their personal area of expertise, in order to extract maximum value from each workshop session.

**Critical Hit**

It's vital that each individual team member shares detailed feedback on the workshop they attend with the rest of their team. That way, all the team members will be up to speed on the insights each of them gained, priming them to progress as an informed and cohesive unit.

Supporting Your Teams During the Challenge Kick-Off

Given the Challenge Kick-Off is your teams' final opportunity to perform checks and plan out changes before the Challenge itself, it's vital to have relevant experts on hand to provide input as needed.

These experts' niches should span the entire range of themes covered by the Challenge Kick-Off workshops.

So, we'd recommend making sure the following are around to provide support:

- Creative designers and/or art designers
- Concept developers
- Financial and/or business development experts
- Marketing experts
- Legal experts
- Medical professionals
- Research/ethical experts
- End users

As the Challenge Kick-Off is the final stage before the teams' products will be used in practice, your teams may well require input from each and every one of these specialist areas.

At this stage, any modifications that the teams make to their final designs will likely impact a range of product-related aspects. Enhancing gameplay experience could influence financial planning, for instance. Likewise, adjusting technical solutions could require additional checks on legal compliance.

For this reason, it's likely that each team will turn to a variety of the experts on the ground during the Challenge Kick-Off for advice.

**XP Boost**

Encourage your teams to take a holistic view of any modifications they make to their products at this point. Changes made are unlikely to be self-contained within each workshop theme, instead rippling out into other areas.

**Critical Hit**

It's especially vital to have experts as part of the audience for the teams' learnings pitches during the Challenge Kick-Off round-up. At that point, expert input is - quite frankly - priceless.

Looking Towards the Challenge

Once the Kick-Off session is complete, your teams will be ready to produce the various deliverables that will enable them to move on to the final Challenge phase.

Each team will need to line up all of these deliverables in the time period between the Challenge Kick-Off and the Challenge itself. While all the deliverables are essential, only some of them will need to be fully finalised before the Challenge begins.

Below, you'll find an outline of which deliverables need to be ready to go before the Challenge starts and which simply need to be initiated.

Finalised and ready to implement

- A Product Modification Action Plan
- A clear overview of who's responsible for each individual action point
- An implementation timeline for the Action Plan
- A draft Research Plan
- A list of clearly defined and measurable objectives for the results of the Challenge
- A legislation check
- A Medical Ethical Committee (MEC) check
- A dashboard for the Challenge phase

Works-in-progress, to be continuously reviewed during the Challenge

- A Dissemination Plan
- A Marketing & Sales Plan
- A Management & Funding Plan

**Critical Hit**

The Dissemination, Marketing & Sales and Management & Funding Plans should absolutely still be flexible, open to influence and informed by learnings from the Challenge phase. However, the teams must acknowledge that it's vitally important these are all at least drafted up before moving towards releasing their final product.

Once all the teams have actioned these various deliverables, they'll be ready to move on to the final Challenge.

“The enthusiasm and passion of this group has been fabulous to engage with. Collaborating across disciplines as well as international contexts has been a tremendous experience. The challenges of COVID has really interrupted our communications as well as the Challenges workplan.”

— Professor Dido Green, London (UK)

PART 5 | SECTION 3

The Challenge

IN THIS SECTION

- **Introducing the Challenge**

- **Developing the Business Plan**

- **Supporting your teams during the Challenge**

- **The Challenge: final deliverables**

So, the Challenge Kick-Off Meeting has been successfully completed, with all the relevant action points taken care of. Now that the Challenge preparation groundwork is all neatly laid, it's time for the real deal to begin.

As we've seen, the Challenge is your teams' chance to validate their products in a clinical setting. This will enable each team to gather real world evidence on their products' efficacy, efficiency and feasibility.

A typical Challenge is, in fact, a fascinating mix between a scientific experiment and a social study. During this phase of the project, the teams will test the hypothesis that the therapeutic product they have developed is efficient, effective and feasible (the main objectives). That, of course, is the scientific experiment. Simultaneously, however, the teams will record the end users' experience, which contributes the social study aspect.

How Is the Challenge Structured?

The way in which the Challenge phase is set up will largely depend on 2 major factors:

1. When the healthcare professionals and patients and/or clients are available
2. The development stage of the prototype itself

The combination of these factors gives rise to 2 Challenge phase testing scenarios:

1. Early stage prototype, with low availability of end users
2. Later stage prototype, with high availability of end users

In *scenario 1* the teams will need to design a study that takes an iterative approach. By contrast, in *scenario 2* the teams will be able to take a larger-scale approach.



Critical Hit

Since the teams' proposed therapeutic products are now in a late stage of development, any findings gained from the Challenge should be used to fine-tune their product. The findings should not result in any drastic alterations of the products' core features.

Using the Challenge to inform the Business Plan

Your teams will also use the Challenge phase to further develop their respective Business Plans. Based on their findings from the Challenge, the teams will flesh out the draft version they drew up earlier into a more realistic and coherent Business Plan.



Cheat Code

Skip back to Part 4, Section 3 to revisit drafting Business Plans.

Gaining better understanding of end user needs during the Challenge will allow your teams to add various key elements to their Business Plans:

- A preliminary pricing scheme
- An overview of channels they plan to use to market their product
- Potentially, a sales and profit forecast



XP Boost

These additions to the Business Plan will provide key support for your teams when they're pitching their product to investors (or other funding sources) to finance taking the next steps in developing and - eventually - implementing their product.

**Critical Hit**

Ensure your teams plan out the questions they'll need to ask end users during the Challenge phase in order to gain insight into affordability, as well as the potential marketing channels on which their audience spends its time.

Providing Support During the Challenge

At this stage of the project, the amount of contact you have with your teams will decrease. Rather than you running the show, they'll be out testing their prototypes with potential end users.

So, it'll be feet up and pat on the back time for you as the project organiser! However, before you get too comfortable, you'll still need to make sure that each team has access to expert support as needed.

It's especially important that the teams can still run their ideas and progress by experts in fields from outside their own team members' knowledge areas. For example, one team might not contain a designer, so will need an external expert to weigh in. Another team might have several members who are professional designers, but need external support on research or regulation.

**Critical Hit**

Research and regulation are 2 areas of expertise that will hugely impact the outcome of the project. It's key to have experts from both of these highly specific fields on hand, to ensure the teams' research methods comply with present and future international standards, rules and regulations.

**XP Boost**

What each team specifically lacks - if anything - will have become clear during the Challenge Kick-Off, when the teams wrote out their Product Modification Action Plans.

**Cheat Code**

Head back to Part 5, Section 2 to review the Challenge Kick-Off Action Plan deliverable.

**XP Boost**

We'd recommend using the Digital Dashboard to facilitate and log the teams' ongoing communication with the experts you've drafted in. That way, everyone involved - from you as the organiser, to the experts, to the teams themselves - can keep track of how things continue to develop.

The End of the Challenge: Final Deliverables

While it might seem a far-off fantasy now, the day will come when you and your teams reach the very end of the Challenge.

To tick those final boxes, your teams should finish up with the following deliverables:

- Their finished product
- An overview of the achieved objectives (effect, efficiency, feasibility)
- A Business Plan, including Dissemination, Marketing & Sales and Management & Funding Plans
- A Pitch Deck
- An Implementation Plan

At this point, your teams will be ready to launch their product on their chosen market. They're all set to fly the nest! To give them the best possible shot at success, we'd recommend sharing these final pieces of advice with all your teams:

Bring medical experts on board as spokespeople - with thorough briefing thrown in

Your teams will have worked with medical experts throughout their product development. Now, they should aim to bring those experts on board as spokespeople for their product, to build and maintain its reputation as it goes to market. Essentially, they'll act as the product's expert ambassadors.

These medical professionals will, therefore, play a key role in how the product is portrayed and received by acclaimed publications, mass

media, the medical community, patients and the general public. So, they'll need to be up to the task in terms of availability, personality and shared vision for the product. Of course, it'll also be the teams' responsibility to brief them accurately, thoroughly and in good time for each relevant appearance, event, or interview.

Strategise your ongoing investment - seek out “smart money”

Finding investment is, of course, primarily about the monetary influx your teams can use to drive their product forward. But sourcing investment is also about making key connections that will open doors. Encourage your team to seek out “smart money” investors, who can provide not just the cash, but the contacts as well.

As for the brains behind this Innovation Blueprint, that's all from us for now. Our team sincerely hopes that you've found this outline a useful tool for planning out your own project.

If you have any questions or feedback for us, feel free to contact us at info@vr4rehab.org. We'd love to put our heads together to continue optimising this Innovation Blueprint based on your project experiences.

“We made many mistakes, as always, and hopefully we’ve learned. Not nailing down intellectual property rights was a running sore although we didn’t get to the stage of seeing practical problems arising. Spending too much time at one of the hackathons trying to resolve differences of opinion between two groups was a mistake. These things are fast moving and when some relationships are obviously incompatible then it’s best to shuffle the pack.”

— Professor Denis Martin, Middlesbrough (UK)



The use of VR in pain management.

PART 6

The Part of Tens

IN THIS PART

- **Dos, Don'ts and Key Resources to guide your Innovation Project to success**
-

10 Innovation Blueprint DOs and DON'Ts

DOs

- 1 DO** include Stakeholders with specific knowledge and expertise in each team, depending on the type of healthcare application to be developed. For example, you'll need a very different pool of experts for a team working on an upper limb rehabilitation game, as opposed to a cognitive rehabilitation game.
- 2 DO** release your video message to encourage participation in the Hackathon at least 2 months before it's due to take place. The longer the better, really, as professionals working in the healthcare sector need advance warning to schedule time off to take part.
- 3 DO** leverage different and/or additional communication channels to specifically advertise your Hackathon to SMEs and other non-healthcare Stakeholders.

4 **DO** ensure all your teams' members know they ideally need to be present for the full duration of all the project stages. Full attendance is most vital, however, for the Hackathon and Challenge Kick-Off sessions.

5 **DO** make sure that participants with no previous Hackathon experience feel welcome and supported throughout the innovation process. This is vital to ensuring that your project benefits from an optimal range of innovative inputs from all the relevant professional and social sectors.

6 **DO** make sure that each team is aware of the clear definition of what's expected from their prototype before the Game Jam begins.

7 **DO** involve patient Stakeholders in the Game Jam, as insights into the Customer Journey will be key at that stage.

8 **DO** ensure all the teams record detailed patient and clinician feedback from the Challenge. This is vital for shaping their future Business Plan, as themes such as usage time (number of patients that can use the game per day), unforeseen additional requirements for resources and implementation, etc. could come up.

9 **DO** ensure your teams plan out the questions they'll need to ask end users during the Challenge phase in order to gain insight into affordability, as well as the potential marketing channels on which their audience spends its time.

10 **DO** have research and regulation experts on hand to ensure the teams' Challenge phase research methods comply with present and future international standards, rules and regulations.

DON'Ts

- 1 DON'T** neglect your planning. Ensure you block out enough time to complete each stage of the project, as well as keeping your teams and external expert participants informed well in advance.
- 2 DON'T** shy away from defining the project themes clearly during the Partner Meeting, as this will help you to select the best-suited team members further down the line.
- 3 DON'T** forget to communicate your overall Moonshot idea directly to all the potential project participants that you contact, as this is the clearest way for them to see the added value the project represents for them. Ultimately, this should help to bring in more Stakeholders and Project Partners

4 **DON'T** underplay the level of commitment and perseverance required from your project participants. In the Pitching Ideas stage of the Preparation Phase, it's essential that the panel or jury points out possible challenges in the innovation process to give participants a clear idea of where they're headed.

5 **DON'T** underestimate the importance of having your on-hand experts wander around the teams throughout the Hackathon so that their expertise can be equally distributed. This will help to keep efficiency and motivation high, and frustration low.

6 **DON'T** forget to include patients and medical professionals within the group of project Stakeholders who are able to give feedback on the teams' proposed prototypes. Their input is key, given the importance of the Customer Journey in healthcare product development.

7 **DON'T** set Dissemination, Marketing & Sales and Management & Funding Plans in stone before the Challenge. These should all still be flexible, open to influence and informed by learnings from the Challenge phase.

8 **DON'T** let your teams forget they should record detailed patient and clinician feedback from the Challenge. This is vital for shaping their future Business Plan, as themes such as usage time (number of patients that can use the game per day), unforeseen additional requirements for resources and implementation, etc. could come up.

9 **DON'T** allow your teams to make any drastic alterations to their products' core features based on findings gained from the Challenge. These insights should simply be used to fine-tune their product.

10

DON'T skimp on the Business Plans. Your teams will only be able to properly address the final, crucial question of locking in adequate investment and funding for their product once they have a proper Business Plan prepared.

“The mistakes we made? So many... having a back-up plan for the unexpected would have been good, but no one saw the pandemic coming or the type of impact it would have. I have learnt to ensure that the organization has individuals in their finance department to support a project before agreeing to be involved.”

— Professor Dido Green, London (UK)

10 Innovation Blueprint Key Resources

[X, the moonshot factory](#)

For introducing the potential of Moonshot Thinking.

[Fogg Behavior Model](#)

For designing the desired structural and behavioural change outcomes in Hackathon Phase 3: Design Principles.

[Start with Why](#)

For formulating pre-project questionnaires in the Preparation Phase.

[Strategyzer's Business Model Canvas Explained introduction video](#)

For swotting up on the Business Model Canvas tool in preparation for the Game Jam: Preparation Phase.

[VR4REHAB - Virtual Reality for Rehabilitation](#)

VR4REHAB project site.

[VR4REHAB - Virtual Reality for Rehabilitation](#)

VR4REHAB open innovation network.

[Game Solutions Lab](#)

[Games for Health Europe](#)

[Health Valley Netherlands](#)

[Sint Maartenskliniek](#)

[Interreg North-West Europe Programme](#)

Our VR4REHAB Projects

Adherence



Crystal Ball



Hands Around the World



Move VRee



Moving Reality



Pain Toolkit



Trunky XL



VR Traveller



Colophon

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