



# Innovator Handbook

July 2020



## Global Surgical Training Challenge

**INTUITIVE**  
Foundation

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Challenges

**MIT** | **SOLVE**



# Innovator Handbook

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# Glossary

## Global Surgical Training Community

Global Surgical Training Community – an online platform created as a legacy from the Global Surgical Training Challenge to serve global surgical educators. The platform will host surgical training modules created as part of the Challenge, with additional modules developed following the Challenge.

## Low and middle income countries

For the purposes of this Challenge, those countries in the current World Bank list of low and middle income countries.

## Open-source

For the purposes of this Challenge, open source is defined as referring to something people can modify and share because its design is publically available.

## Resource-constrained setting

For the purposes of this Challenge, a setting within a low and middle income country, such as a region or district where resources (such as electricity, sanitation, education) are limited.

## Self-assessment framework

A tool, such as a checklist or app, that enables learners to assess their own skills acquisition.

## Simulation-based training

Involves the use of basic equipment or computer software to model a real-world scenario. During simulation-based training, the learner is taught how to perform certain tasks or activities in various real-world scenarios so they will be better prepared should the event actually occur.

## Surgical module

For the purposes of this Challenge, a package of open source know-how to build a surgical training model and the associated training materials needed to train and self-assess skills acquisition using the model.

## Surgical practitioner

For the purposes of this Challenge, all medical roles involved in surgery (surgeons, anesthesiologists, midwives, clinical officers, nurses, students).



# How to use this handbook

This handbook contains all the information you need to apply to and participate in the Challenge, including:

- Background on the Global Surgical Training Challenge.
- What the Challenge is aiming to achieve and the types of solutions we are looking for.
- Who can enter, and what is involved in participating in the Challenge.
- The support and awards available.
- How you can enter.

We recommend that you read the entire handbook (along with the full [Terms and Conditions](#) and [Frequently Asked Questions](#)) before you enter the Challenge.

If you have read the handbook and still have questions, or would like to speak to someone about your entry, please contact the team at [globalsurgicaltraining@challenges.org](mailto:globalsurgicaltraining@challenges.org)



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# Who's involved?

**INTUITIVE**  
Foundation

**The Intuitive Foundation** is dedicated to reducing the global burden of disease and suffering through philanthropy, research and education aimed at better outcomes for patients everywhere.

**The Foundation funds the Global Surgical Training Challenge.**

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**nesta**   
**Challenges**

**Nesta Challenges** exists to design and run challenge prizes that help solve pressing problems that lack solutions. We shine a spotlight where it matters and incentivise people to solve these issues.

**Nesta Challenges is a Challenge design and delivery partner.**

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**MIT** | **SOLVE**

**Solve** is an initiative of the Massachusetts Institute of Technology (MIT) with a mission to solve world challenges. Solve is a marketplace for social impact innovation.

**Solve is a Challenge delivery partner.**



# Section 1: Introduction

## 1.1 About the Global Surgical Training Challenge

In resource-constrained settings globally, many surgical practitioners are unable to access low-cost, simulation-based training. Due to a lack of access to cadavers, animal models or simulation-based training, many surgical practitioners undertake procedures for the first time on patients. The Global Surgical Training Challenge aims to address this.

The Intuitive Foundation, in partnership with Nesta Challenges and MIT Solve, have launched the Global Surgical Training Challenge. The Challenge stimulates the creation of novel, low-cost surgical training modules to enable skills acquisition and self-assessment for surgical practitioners and surgical trainees.

The Challenge aims to create a paradigm shift in the way surgical training is delivered by giving surgical practitioners access to freely accessible training modules that will allow them to assess their own skills. Each surgical simulation model will be accompanied by a self-assessment framework, allowing surgical practitioners to test their newly acquired skills. All modules (the model, know-how for build and training materials) will be free to download online from the Global Surgical Training Community platform.

## 1.2 Key dates

Challenge stage	Date
<b>Launch</b>	15 July 2020
<b>Solveathon Workshops</b>	Multiple Dates, July to October 2020
<b>Discovery Awards</b>	
Applications open	16 September 2020
Applications close	11 November 2020
Winners announced	TBC December 2020
<b>Finalist Awards</b>	TBC December 2021
<b>Grand Prize</b>	TBC December 2022



# Section 2: What are we looking for?

## 2.1 Our vision

The most comprehensive surgical training programs rely on access to cadavers, live animal training models and expensive simulation-based training. Without access to such training, surgical practitioners in resource-constrained settings often have less hands on experience before they are expected to operate on patients. The Global Surgical Training Challenge aims to address the need for lower cost simulation-based training by incentivising the creation of such models.

The Challenge also aims to shift the way in which such simulation-based training is delivered. The current paradigm sees simulation-based training take place in a classroom setting. We want to shift the focus on to self-assessment; allowing surgical practitioners the ability to learn new skills and test their own skills acquisition independently. So along with the development of new training models, competitors in the Challenge will be asked to create self-assessment frameworks that allow surgical practitioners the ability to test their own skills acquisition outside of a classroom.

Ultimately, the Challenge aims to populate an online community platform with surgical training modules. These modules will contain all the know-how needed to create and build the surgical training model, perform the training and assess skills acquisition. These open-source modules will be validated by both the competing team and through an external validation process, to ensure modules effectively teach outlined skills.



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## 2.2 Beneficiaries

The Challenge aims to benefit surgical practitioners and surgical trainees in resource-constrained settings through the creation of new surgical training modules.

## 2.3 Entrants

Creating these novel surgical training modules can only be achieved by multidisciplinary teams with experience in resource-constrained settings. We are looking for educators, clinicians, technology developers and creatives, including;

- Surgical education specialists with experience working in resource-constrained settings
- Clinicians with experience working in resource-constrained settings.
- Engineers, software and game developers.
- Artists, medical illustrators, designers.

We anticipate many of you wishing to apply will already be working in such multidisciplinary teams. However, we also anticipate interest from individuals from unrelated fields and we will work with you to place you in a team suitable to take on the Challenge.

## 2.4 What to consider when developing your solution

The Global Surgical Training Challenge is looking for applications from multidisciplinary teams who can collaboratively create new surgical training modules that allow for the training and assessment of skills acquisition.

We encourage highly innovative entries utilising any relevant affordable technology. The Judging Panel will favorably consider frugal innovations that do not rely on high-tech solutions. All know-how on the build and training components of the surgical module must be made available open source to users on the Community Platform. The Challenge is open to completely new, early stage ideas or existing solutions that are pivoting or adding new elements or functionality.

**The modules created should focus on the acquisition of one or more of the psycho-motor skills needed to deliver a critical step of a specific surgical procedure.**

Preference should be placed on elements of procedures that are either technically complex and/or do not happen frequently enough for surgeons, trained medical staff performing surgery or surgical trainees to experience them in their practice, as both of these scenarios result in an increased risk of patient mortality.





Targeted surgical skills be complex enough to necessitate simulation training by surgical practitioners or surgical trainees who possess basic surgical training.

If selected as Discovery Award winners, entrants will be expected to utilise their grant to develop an initial prototype and self-assessment framework. If selected as Finalist Award winners, entrants will be expected to utilise their grant to further iterate and improve their initial prototype, develop further use cases for their surgical module and perform an internal validation process. In addition, all Finalist Award winners will undergo an external validation process at a clinical site contracted by the Intuitive Foundation.

## 2.5 Why a Challenge?

Challenge competitions are a tried and tested method for supporting innovation. They act as an incentive for meeting a specific target. Challenges are also a means of opening up the process of solving a problem beyond the 'usual suspects', thus facilitating the engagement and participation of anyone who can solve the problem.

## 2.6 The Challenge Statement

The Challenge Statement is our call to action to innovators. It articulates the Challenge's aims and what we want entries to deliver. Discovery Award winners, Finalists and, eventually, our Grand Prize winner will be selected on the basis of how well they meet the Challenge Statement.

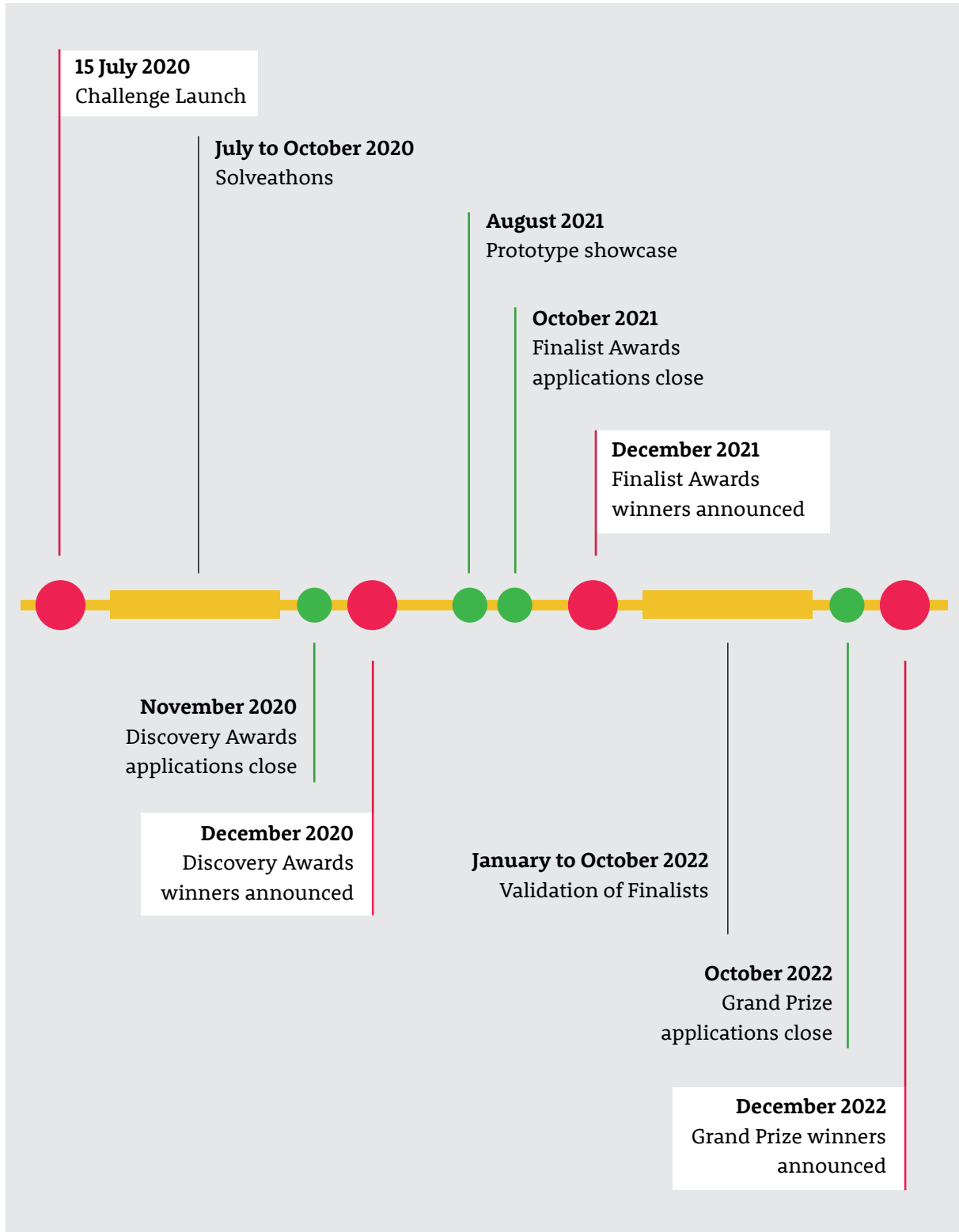
The Global Surgical Training Challenge aims to enhance training for surgical practitioners in resource-constrained settings through the creation of innovative new surgical training modules that can be used to teach and assess skills acquisition.

Modules created as part of the Challenge will be freely available for download on a community platform and should be packaged with know-how to build the model and to train and assess psycho-motor skills acquisition.

Grants of up to \$200,000 at the Discovery Award stage and \$500,000 at the Finalist stage will be given to fund development of prototypes and latterly further model development. A final award of \$1 million will be awarded to the team that has demonstrated that their original model and further models developed as a Finalist are validated and impactful.



## 2.7 Overview of challenge structure





# Section 3: What are we offering

## 3.1 Financial support

To support innovators through the development of their solutions, we anticipate 10 applications will receive a Discovery Award of up to \$200,000 (the amount awarded will be dependent on complexity of solutions and a budget approved by the Judging Panel) to develop their prototype modules.

Following prototype development, Discovery Award winners and new applicants will be invited to submit their prototype surgical modules to be considered for a minimum of three grants of up to \$500,000, the Finalist Awards.

Finalists will then submit their improved prototype and additional modules created during the finalist development period to be assessed for the Grand Prize. The Judging Panel will award the \$1 million Grand Prize to one team judged by the Panel to have made the most impactful set of training modules.

## 3.2 Non-financial support

During the Challenge, in addition to financial support, grantees at both the Discovery Award and Finalist stages will have access to capacity development support and a package of tools to help develop their solutions.

This in-kind support will be tailored to the needs of innovators while ensuring equity of support and access. The nature of this support will be discussed with competitors applying to the Discovery Awards in late 2020.



Photo by ©MIT Solve



### **3.2.1 Solveathon workshops**

Following the Challenge launch in July 2020, MIT Solve will host a series of Solveathon workshops, virtual, high-energy workshops designed to strengthen projects for the Global Surgical Training Challenge.

We're hosting Solveathon workshops in five regions globally. Each region will have three activities: online networking, a Team Building Solveathon, and a Refinement Solveathon.

During these Solveathons workshops, you will:

- Connect with professionals who are interested in surgical training.
- Further your understanding of the Challenge and requirements to compete.
- Build or expand your project team.
- Refine your project through facilitated design thinking activities developed at MIT.
- Work to develop your knowledge on how to compile a skills assessment framework.

### **3.2.2 Package of tools**

Discovery Award winners will have access to a number of tools to help develop their prototype. The Challenge team will review proposals submitted to the Discovery Awards and select a suite of tools that match the needs of the largest set of teams.

### **3.2.3 Prototype pitch event**

During the prototype development phase, ahead of the Finalist Awards in December 2021, Discovery Award winners will pitch their prototype to the Judging Panel in August 2021 (location and venue TBC). This one day pitch event, run by MIT Solve, will allow innovators the opportunity to workshop issues with peers and receive valuable feedback from the Judging Panel ahead of final submission.

### **3.2.4 Mentorship**

Throughout both the Discovery Award development and Finalist development phases, innovators will have the opportunity to be mentored by a leading surgical education organisation. The mentors, to be announced ahead of the Discovery Awards in December 2020, will provide support on model development and feedback on usability in the field.





# Section 4: Who can enter

## 4.1 Eligibility criteria

The eligibility criteria set out who can enter the Challenge and what will be required of participants. These criteria help those running the Challenge to fairly sort through applications and select those participants best placed to deliver against the Challenge's aims. The eligibility should be read in accordance with the Challenge [Terms and Conditions](#). Please also refer to guidance documents such as the [FAQs](#).

The eligibility criteria for the Global Surgical Training Challenge are as follows:

1. **Team lead from a low-income or middle-income country** – The Challenge is open to teams made up of individuals. Team members can be individuals from any organisation or company, and from any country, not currently listed on the [US Sanction List](#), as long as the project lead is based in a low or middle-income country, defined by the [World Bank List](#).
2. **Multi-disciplinary teams** – Competing teams must have team members that fulfil at least three key roles – educator, clinician and technical expert. Where applicable, two roles can be fulfilled by the same person but multidisciplinary collaborations and clear sharing of responsibilities is strongly preferred. The team members will take ownership of the following responsibilities:
  - a. **Educator** – manages the pedagogical objectives of the training module, expert in the field of skill acquisition and assessment.
  - b. **Clinician** – surgical practitioner with clinical experience in LMICs, who will contextualise the design of the simulation training module with first-hand experience.
  - c. **Technical expert** – manages the development of the technology and materials needed for the delivery of the simulation module.
3. **Open-accessibility of solutions** – all solutions created through the Challenge will be required to be freely available through a platform created by the Challenge. Further details given in the [Terms and Conditions](#).
4. **Entry to Finalist Awards and Grand Prize** – applicants to the Finalist Awards are not required to have previously received a Discovery Award to be eligible. Thus participants who applied for a Discovery Award are still eligible to apply for a Finalist Award. However, only Finalist Awardees are eligible to apply for the Grand Prize.
5. **Receiving Award funds** – Awards and prizes from the Challenge are described as being made to individuals or teams, so as to promote their personal contribution. Money payments will however only be made to a viable Sponsor Institute as defined in the Challenge [Terms and Conditions](#). We may provide support to help link teams to Sponsor Institutes if required. Please highlight this need in your application if applicable.



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## 4.2 What's expected of me?

All entrants to the Challenge are expected to abide by the [Terms and Conditions](#). Please read these in full before submitting your entry. If you are selected as a grantee, you will be expected to use any funding received through the Challenge for the purposes of developing your solution. This should include developing or testing your solution, and could also cover costs for staff working on your solution, or engaging external expertise or advice (not already provided by the Challenge).

As a Discovery Award grantee, a finalist or the overall winner, you will be expected to participate fully in the Challenge including events, monitoring and evaluation, and publicity and promotional activities relating to the Challenge.



# Section 5: How to enter

## 5.1 Submitting your entry

Entries to the Discovery Awards will be made through the Intuitive Foundation's grant application system when applications open on 16th September 2020.

Entries must be submitted by 12:00 PDT on 11th November 2020.

BlackBaud, the grant management software used by Intuitive Foundation, is a third party platform. For more information on BlackBaud see our [Terms and Conditions](#) and the BlackBaud [privacy policy](#).

Before completing your application form, make sure that you've:

- Read this handbook, our [Terms and Conditions](#) and our [FAQs](#).
- Signed up to your regional Solveathons to engage with other participants and learn more about the Challenge.
- Familiarise yourself with the challenge statement and the judging criteria and make sure you clearly address them in your entry form.

Entries to the Finalist Awards will be made in October/November 2021 with the date to be released with the announcement of the Discovery Award winners in December 2020.



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## 5.2 Judging criteria

This section outlines the criteria that our Judging Panel will use to assess and judge applications throughout the Challenge process. There are three key judging criteria and the information provided below will help you understand what the Judges will be looking for when making their decisions. The same criteria will be used at all stages of the Prize but their focus will be shifted to reflect the progress being made along the development cycle.

### **Innovation and impact**

We're looking for innovative simulation training modules that will enable surgical practitioners and trainees to learn and assess the progress of gaining surgical psycho-motor skills without requiring the presence of a teacher, even if these training tools could also be used by medical schools or others doing collective training.

Applications will be required to explain the need for the surgical skill they wish to train and detail the self-assessment framework they plan to develop. Applicants will outline the procedure (or its key steps) that will be turned into a simulation-based training module and how it will deliver on the objectives of the self-assessment framework.

### **Suitability for use in LMICs (low and middle income countries)**

We're looking for entries which have the potential to reach and support as many practitioners and trainees in LMICs as possible. Judges will be looking to understand how cost-effective and reproducible the surgical modules are in their chosen setting to increase likelihood of utilization post-Challenge. Applicants will need to demonstrate their understanding of both their users' needs and challenges they are facing.

### **Team capability**

We're looking for capable teams with the skills, commitment and capacity to deliver on their submitted application. Judges will be looking for collaborations among the educational, clinical and technological team members with comprehensively defined roles and objectives. The application and associated budget will have to be clearly articulated, ambitious yet achievable within the timeframes given.





### 5.3 How the Judging Panel will assess applications

A panel of judges will assess all eligible applications and make decisions on the selection of Discovery Award grantees, Finalist Award grantees and the Grand Prize winner. The Judges are representatives of the surgical education community, the Challenge funder and other experts with particular knowledge and expertise across surgical training and simulation. The Judging Panel's decision is final.

There are three key stages of assessment in the Challenge; Discovery Awards, Finalist Awards and the Grand Prize. The tables below detail what will be required at each stage.

At all stages of assessment, a technical assessment partner will support the Judging Panel in their decision making. The Intuitive Foundation and its partners will select the technical assessment partner and will make an announcement ahead of the the Discovery Awards in December 2020. At the Grand Prize stage, results from an external validation process carried out by selected clinical sites and an internal validation by the competing teams will also support decision making.

#### Discovery Awards

The Discovery Awards are initial grants to allow teams to develop and test their prototype surgical modules.

<b>Eligibility</b>	Entrants must be eligible to compete as assessed against the Eligibility Criteria.
<b>Application form</b>	<p>Completing a template provided that will detail:</p> <ul style="list-style-type: none"> <li>• Which psycho-motor skill(s) your proposed module will train. The skill(s) should be sufficiently complex to necessitate simulation.</li> <li>• How your proposed simulation module is suitable to deliver training and skills-assessment and how the module is better or more suitable than currently used practices.</li> <li>• A proposed self-assessment framework for the self-assessment of skills acquisition.</li> <li>• A proposed list of handover documentation that will be required to successfully replicate the training module.</li> <li>• The profile of potential users and how the module will be adapted to their needs.</li> <li>• How your team fulfills the required educational, technical and clinical lead roles.</li> </ul>
<b>Budget</b>	Proposed budget required to develop the proposed prototype (from \$25,000 to \$200,000 depending on the level of technological complexity).



## Finalist Awards

The Finalist Awards are grants to allow teams to further develop and improve their original prototype and to develop further prototypes.

<b>Eligibility</b>	Entrants must be eligible to compete as assessed against the Eligibility Criteria.
<b>Application form</b>	<p>Completing a template provided that will detail:</p> <ul style="list-style-type: none"> <li>• The effectiveness of your simulation training module at delivering the training and self-assessment.</li> <li>• Testing you have undertaken to test the prototype with the target users and demonstrate your lessons learnt.</li> <li>• How your prototype addresses the risks of teaching anti-skills and ‘gaming’ simulation results as well as measures taken to prevent them from happening.</li> <li>• How your prototype addresses any potential risks of simulation aftereffects (e.g. feeling of dizziness after VR training) as well as measures taken to prevent them from happening.</li> </ul>
<b>Handover documentation</b>	<p>At a minimum:</p> <ul style="list-style-type: none"> <li>• Simulation-based training module handover documentation (how-to manuals detailing procurement, assembly and operation of training modules together with the educational/theoretical portion of the module).</li> <li>• Skill self-assessment framework.</li> <li>• A library of expert videos demonstrating the skills being trained (or other innovative digital media including augmented or virtual reality).</li> </ul>
<b>Validation protocols</b>	Proposed internal and external validation protocols for the next phase of development.
<b>Budget</b>	Proposed budget required to develop additional proposed prototypes (from \$100,000 to \$500,000 depending on the level of technological complexity).



**Grand Prize**

The Grand Prize will be awarded to the Finalist team deemed to have most successfully improved upon their original prototype and created the most impact through further module development.

<b>Eligibility</b>	You must be a Challenge Finalist to apply to win the Grand Prize.
<b>Application form</b>	Application form detailing all considerations listed for your original prototype as per the Finalist Awards above, and the same for additional prototypes developed during the Finalist development period.
<b>Handover documentation</b>	Revised Handover Documentation as described for the Finalist Awards above for both your original prototype and other modules created during the Finalist development period.
<b>Results of internal validation</b>	Results from both the external and internal validation and iteration process undertaken during the development period to further improve your original prototype.
<b>Grand Prize deliverables</b>	A document outlining your intentions for the Grand Prize monies should you be selected as the overall Challenge winner.



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