

DAVIDSON, A., BREMNER, P. and PERKINS, J. 2021. *The Scottish Innovative Student Awards: preparing students to tackle wicked problems*. Presented at the 2021 Employability symposium: 3E's for wicked problems, 22 April 2021, virtual symposium [online]. Available from: <https://documents.advance-he.ac.uk/download/file/9665>

The Scottish Innovative Student Awards: preparing students to tackle wicked problems.

DAVIDSON, A., BREMNER, P. and PERKINS, J.

2021

Presentation slides appear first, followed by four worksheets that were distributed to attendees. The slides are shared under a CC BY-NC licence, but all worksheets are © Scottish Institute for Enterprise.

The Scottish Innovative Student Awards

Preparing Students to Tackle Wicked Problems

Ann Davidson, Enterprise Programme Director, Scottish Institute for Enterprise
Dr Pauline Bremner, Teaching Excellence Fellow, Robert Gordon University
Dr Joy Perkins, Educational and Employability Advisor, University of Aberdeen



Format for this Session

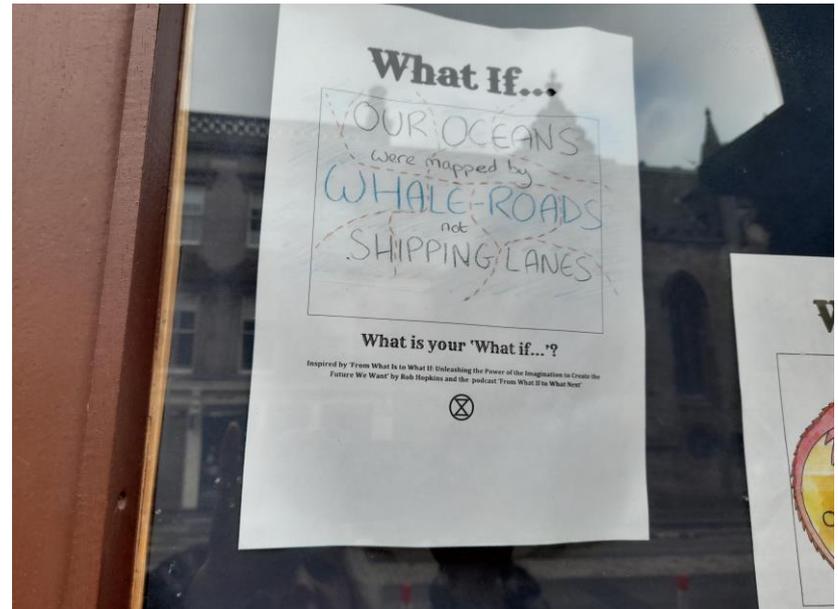
- What is SISA and how does SISA help students to tackle wicked problems with innovation and an orientation towards transforming the future.
- SISA case studies from University of Aberdeen and Robert Gordon University

We Can Get Stuck in the Reality of the Moment

“The reality of the moment is so palpable and powerful that it holds imagination in a tight orbit from which it never fully escapes.”

Dan Gilbert: The Art of Happiness

The Reality versus Imagining Something New



Escaping the Reality of the Moment

“Stories of the future have the power to liberate us from what was and what is.”

- **Mashir Hamid**

Escaping the Reality of the Moment

- Stuart Candy is a well-known designer and futurist who looks at how we can innovate with the future in mind.
- He advocates that if we can think about what the future might look like then we can experience plausible futures to enhance our imagination and escape the reality of the moment.
- This pre-experience of the future allows us to act in the present to ensure we don't default to the inevitable but can look at 'what could be'.
- To transform the future we have to pre-experience it better.



© Stuart Candy



SISA

scottish **sie**
institute for
enterprise

THE SCOTTISH INNOVATIVE STUDENT AWARDS

2020 - 2021



The Three SISA Levels

SISA consists of 3 tiered levels, each of which is a separate micro-credential:



SISA Level 1: Future Thinker



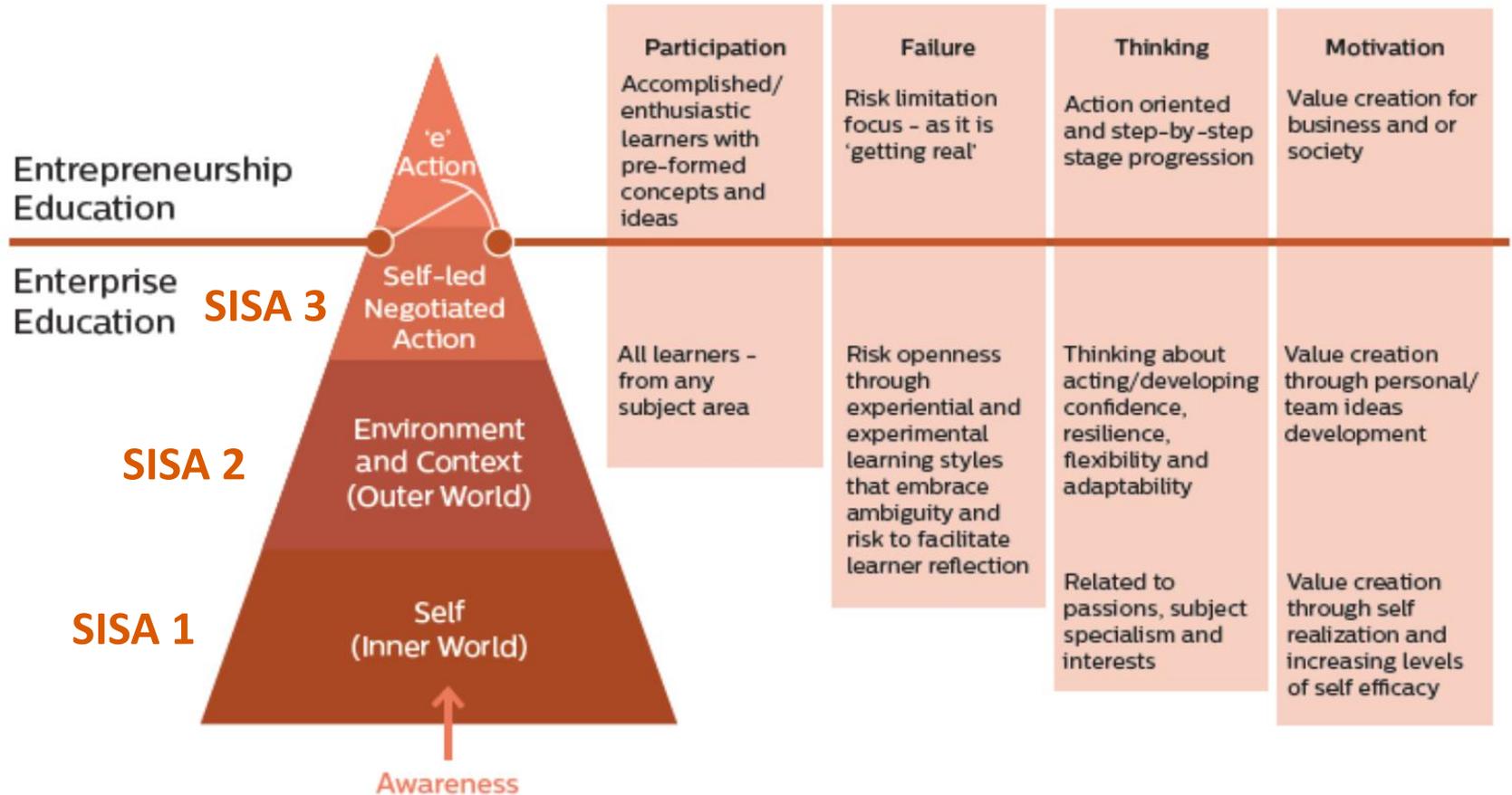
SISA Level 2: Innovation Catalyst



SISA Level 3: Innovation Champion

Each level is a stand alone award and there is no obligation to obtain all three levels. Plus your SISA journey can be staggered over your studies with levels 2 and 3 obtainable up to one year after graduation. However, you must have achieved SISA Level 1 prior to graduation. All 3 levels can be achieved in one academic year.

Where does SISA fit into the big picture...?



Ref: Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers. QAA, Jan 2018

SISA Level 1: Future Thinker

This level is designed to give you evidence-based certification that you have the following innovation competencies that can help you think about the pace of change and the future it is creating, and the opportunities, issues and risks that you can see in this future:

- *Self-awareness and self-efficacy*
- *Flexible and adaptable, seeing different perspectives*
- *Opportunity recognition*
- *Creative problem solving*
- *Collaboration*
- *Communication*



SISA Level 2: Innovation Catalyst

This level is designed to give you evidence-based certification that you have the following competencies that can help you spot opportunities in this future and act on them in the present to be ahead of the curve and disrupt:

- *Manages ambiguity and uncertainty*
- *Draws on the views of others to co-design work*
- *Works in multidisciplinary teams*
- *Takes ownership of ideas*
- *Influencing and negotiation*
- *Innovative thinking & intuitive decision making*
- *Engages with the pace of change to identify emerging customer needs and expectations*
- *Civic and social responsibility*



SISA Level 3: Innovation Champion

This level is designed to give you evidence-based certification that you have the following innovation competencies that can help you champion the need for innovation to design the future and empower yourself and others to act on this need in the present:

- ***Combines analysis with synthesis, intuition and intuitive decision making, drawn from subject expertise and evaluation of critical factors***
- ***Provides research and other evidence to suggest how ideas can be taken forward over time, taking changing environments and emerging technologies and concepts into account***
- ***Critically reflects on, reviews and evaluates the solutions they have explored***



Design Futures : The SISA Methodology.

- **Step 1: Preparation** – identifying the ‘evidence’ we have to work with in the present day to help us.
- **Step 2: Imagining the Future** – how do we use this ‘evidence’ to build a plausible future that is worth exploring and experiencing.
- **Step 3: Exploring and Experiencing the Future** – how do we engage with the future we have just imagined to look for opportunities and insights as to what this future could mean for us.
- **Step 4: Execution** – Linking our pre-experience of the future to present day action.

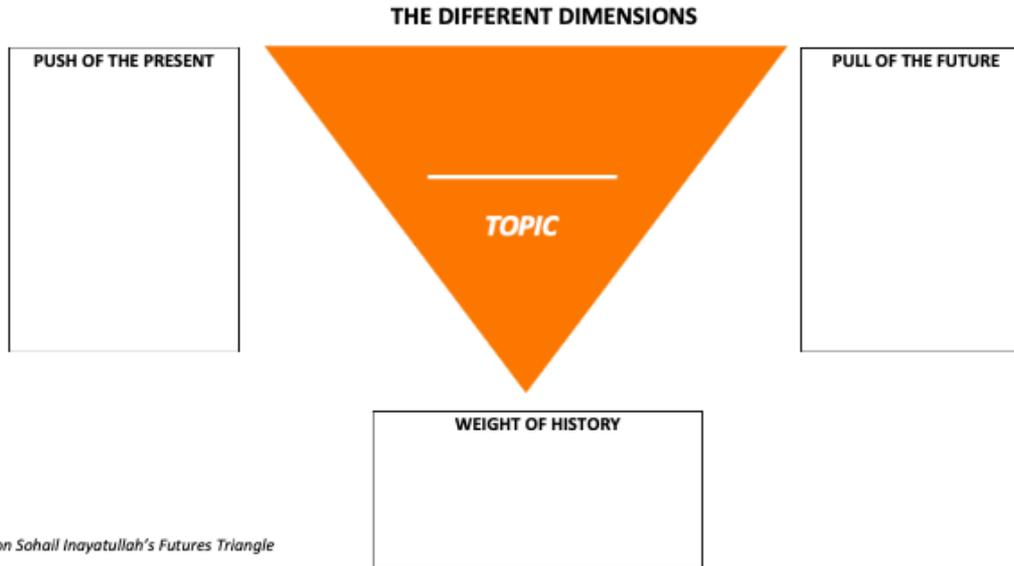
UNDERSTANDING HOW CHANGE HAPPENS

To begin the process of imagining a plausible future it is important to identify the different factors that bring about change. The future occurs over time as strong, subtle and noisy forces interact with each other in the present to influence stability and change. This exercise looks at categorising these forces into 3 dimensions or directions and then exploring how they all interact with each other to shape the speed and trajectory of change.

Use the steps in this worksheet to identify all the forces at play around a chosen topic. Once you have these mapped out you can start to identify the forces with the greatest potential to impact on this topic.

STEP 1

Use this template to map the forces that have the potential to change the future for your chosen topic. Aim to have 3-6 examples in each of the boxes or dimensions.



DEFINITIONS

Push of the Present - Think about the big drivers of change that have the potential to drive change in a certain direction. For example, policies, technologies and changes in society. What impact will they have? Try to use drivers that have strong data to support the impact or trajectory you think they will have.

Also think about finding some signals, small innovations that exist out there in the margins that are starting to indicate how your chosen drivers of change are starting to have an impact. These signals could provide a present day push if they were to gather momentum and scale up. You don't have to like these signals but they make you think about the change they are pushing in the present.

Pull of the Future - Think about values, visions and images that have a persuasive power on people's view of the future. For example, the United Nations Sustainability Goals. They can be positive or negative.

Weight of History - This tends to be anything that can limit the speed of change and what can be achieved. For example, structural barriers like expensive infrastructure, government regulations and the law of physics. But also consider things like people's strong historical connections to something or somewhere, cultural characteristics, behavioural habits and their beliefs.

STEP 2

Review your examples in Step 1 and identify the ones you think will have the strongest influence. Use the Key Tip box to help you assess the strength of your examples.

--

STEP 3

Document below the examples from each dimension that you think are going to influence significantly the future you want to imagine.

Push of the Present

Pull of the Future

Weight of History

KEY TIP

It can help to think of the triangle as having sides made out of string or elastic that are mutually dependent on each other and can pull each other out of shape so that one dimension becomes a stronger influencer. However, the triangle never breaks. For example, what if one of the United Nations Sustainability Goals is such a strong and charismatic pull from the future that it accelerates the need for development of innovation in the present? Or what if a present day push around the social driver of an ageing population can overcome the weight of historical structures and behaviours around the need to care for the elderly in hospital to generate new innovations around their care?

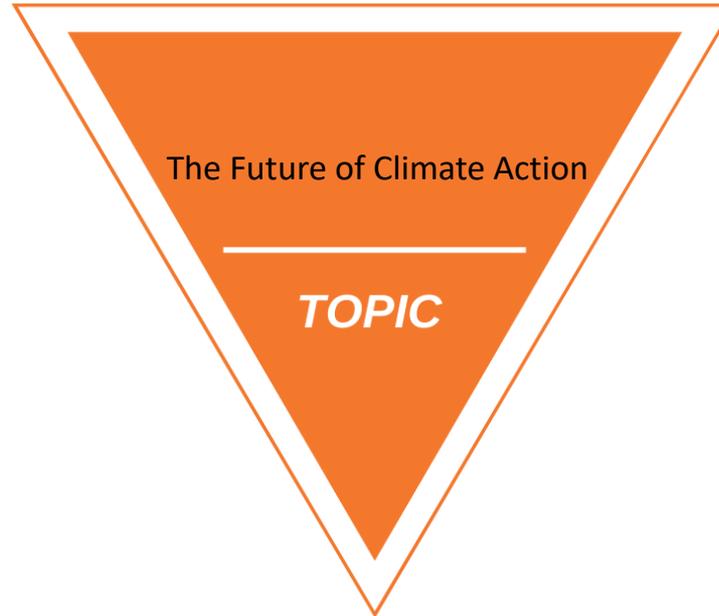
When you are completing steps 2 and 3 think about pulling the 'string' attached to a dimension and what future outcomes this might bring about.



How Change Happens to Create the Future

Push of the Present

Drivers – companies sourcing new raw materials
Drivers – companies concerned with consumer disposal
Drivers – consumers wanting eco-friendly products
Signal – Crafting plastics – plastic products that bio-degrade
Signal - Elvis and Kresse – waste materials becoming valuable new resources and new partnerships entered.



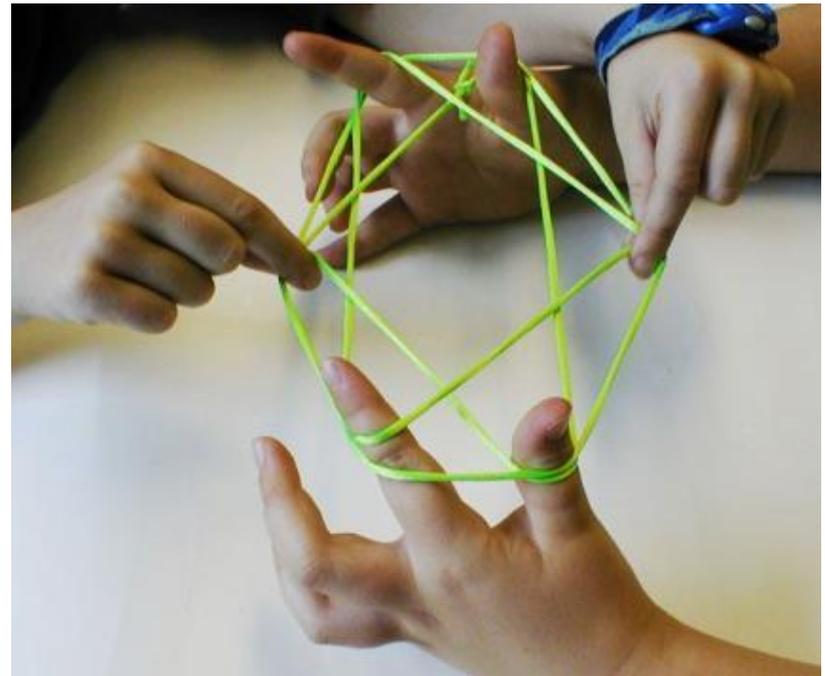
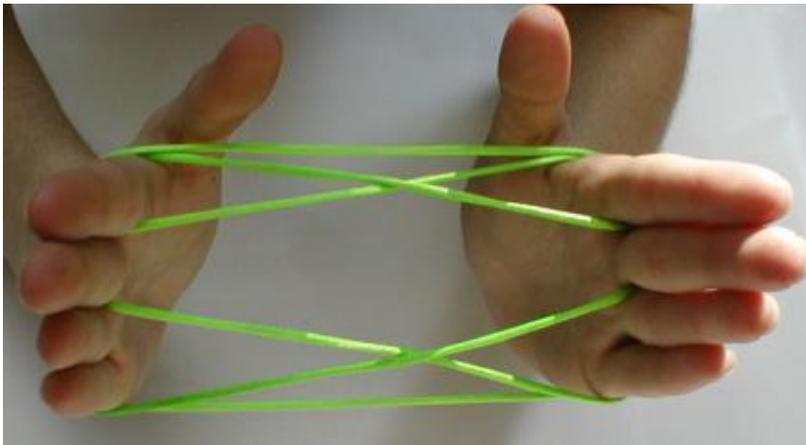
Pull of the Future

- United Nation Sustainability Goals – Goal 13 and all the interrelated goals
- Paris Agreement
- David Attenborough's documentary
- UK Government's policy on no carbon emissions by 2050

Weight of History

- Expensive infrastructure – buildings, roads and trains
- People's attachment to working in an office
- Funding of large scale projects rather than smaller based community projects
- Affordability for different population segments.

Step 2: Imagining and Building the Future



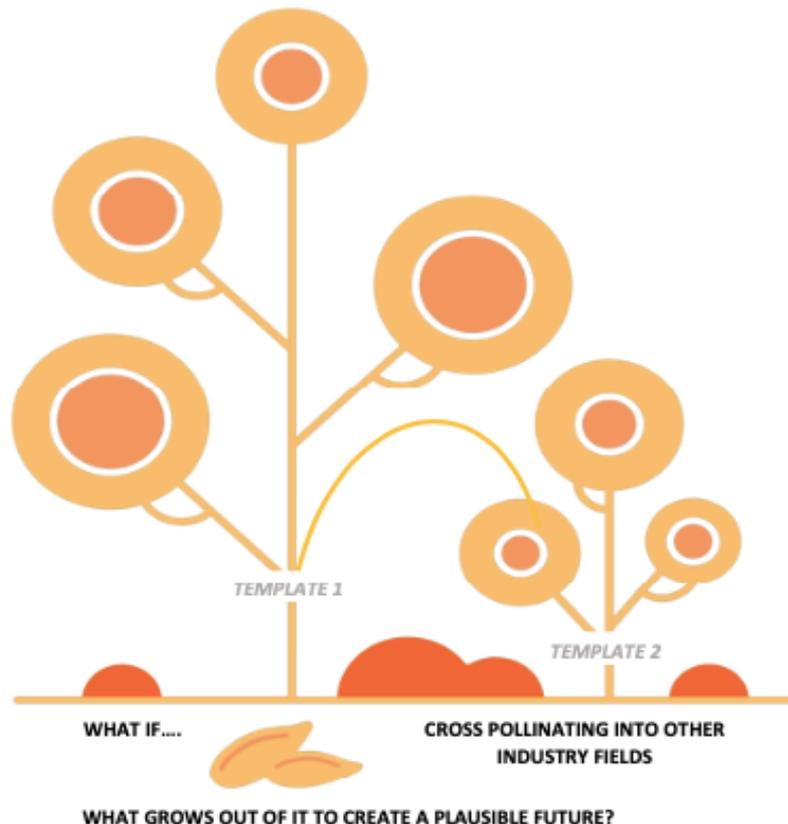
BUILDING A FUTURE WORLD

This worksheet is designed to help you take the forces of change you have identified around your chosen topic and use these to begin the process of building a well thought out future world in which you will explore the issues existing in this new world and the innovations needed.

STEP 1: Select a force for change that you think will impact on your chosen topic and then use this force to generate a short 'What if....' statement that describes a future world that this force could generate.

What if

in 5 years' time?



HOW IT WORKS

Think of your 'what if' statement as a seed you can plant in your imagination. What sort of future can you imagine growing from it? Populate the boxes with details of what you think will exist. You can add in more. These details can be products, services and policies. However, they can also be issues like privacy, data sharing concerns and social problems like loneliness (these are just general examples).

Plants will also pollinate other patches of ground – in this case a another industry sector. If you think your 'what if' statement can do this then repeat the process for TEMPLATE 2.

STEP 2: BUILDING YOUR WORLD

In a couple of lines describe a world that features what has grown out of you planting your 'what if' statement in your imagination. Make it short but specific - describing the products and services being used and detailing any issues this future world might have.

This is a world in which....

STEP 3: EXPLORING THIS WORLD

Are the people you can identify in this world happy and enjoying the products and services in it?

If yes – what opportunities do you see for innovations in the present to bring about this future world?

If no, or the products and services don't meet their needs in full, what opportunities can you see for innovations in the present to change your future world for the better?

What new job roles and organisations will be in this future world?

What skills and competencies will be needed?

Executing the Future

- Linking foresight and insights to present day action
- The key is to act. Once you have understood and pre-experienced possible futures you can plan for action in the present.

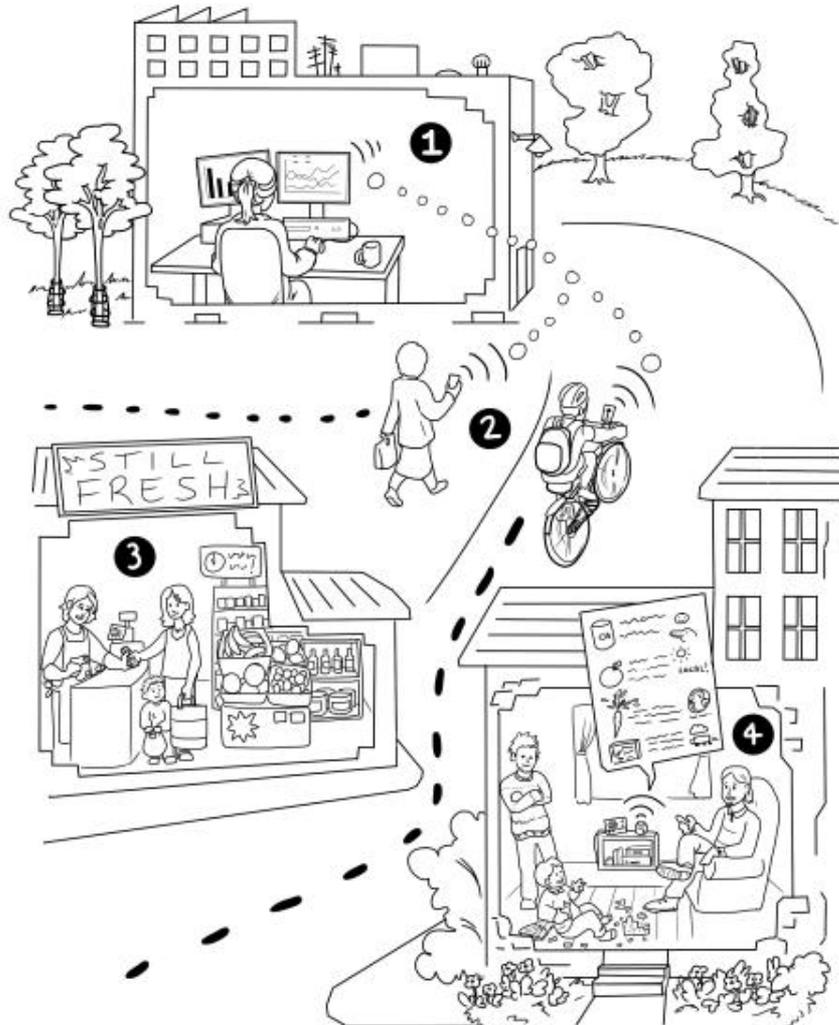


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- ***Critically reflects on, reviews and evaluates the solutions they have explored***





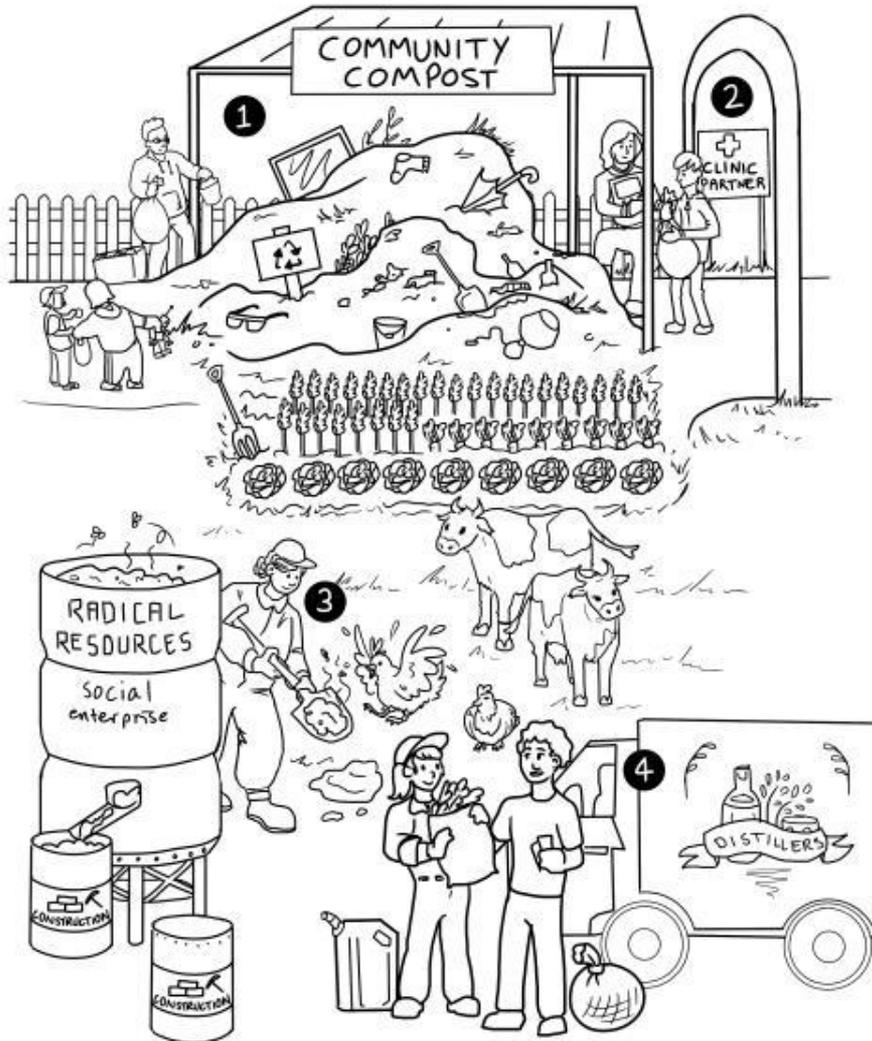
Part of Something Bigger

Artefact 1. Here we see the Human Resources Department of a private company collating the data generated by the Green Footprint APP that it provides to all its employees. This APP is provided by the City Council for a small fee to local businesses of all sizes to help their employees make the decision to walk or cycle to work and to see the impact of their efforts on city pollution levels. The company reports the impact the actions of their employees have on air quality in their annual report and financial statements in order to show that the company is playing a part in implementing the United Nation's Sustainability Goals. It is often the first set of figures their investors and potential partners look for.

Artefact 2. Employees of the company are motivated to walk or cycle to work on a daily basis thanks to their use of the Green Footprint App that is provided to them free of charge by the company. They like the fact that they get a weekly report on their individual impact on city air quality and they get a monthly report on the company's collective impact.

Artefact 3. Situated in one of the busiest commercial areas of the city is a supermarket with a difference. Still Fresh is open for people to shop on their way home from work. Laid out like a traditional express supermarket, Still Fresh has one major difference, all the food is just passed its sell by date but still considered good to eat. Shoppers get a digital receipt to their phone that tells them the impact their choice to shop there has had on carbon emissions.

Artefact 4. Thanks to the use of smart assistant hubs like Alexa, the family can choose items for the family weekly shop that are environmentally friendly in terms of how far they have travelled from their source, if the packaging is sustainable and if ingredients are sourced ethically.



Virtuous Nature

Artefact 1. The local farm operates a community compost heap with a difference. Thanks to some unique bio organisms introduced into the heap, people can drop off items like plastic bottles and other items made from plastic that can be broken down by these organisms. The compost is then used to fertilise the farm's crops with surplus bags of compost sold to local gardeners.

Artefact 2. Helping to run the project is a member of the farm team who is helping out as part of a social prescription provided by his doctor. His mental health is improving greatly by being out in the fresh air and helping out with a project that helps the environment.

Artefact 3. The farm has a large dairy herd and the owner is aware of the impact the methane gas from dairy farming has on the ozone layer. To offset this impact the farm is part of a project that takes one of the waste materials from this type of farming – manure – and turns it into a new resource. Manure is collected for uplifting by Radical Resources, a social enterprise, which aims to take some of the world's less valuable waste products and re-purpose them into brand new and valuable resources for use across different industry sectors. In this instance, this manure will be turned into bricks for a local construction company.

Artefact 4. Another unusual partnership the farm has is with a local distillery that collects the chaff from the farm's barley harvest to help it manufacture its new recyclable packaging.



Dr Joy Perkins
Case Study 1: SISA: Institutional Engagement

Why we value SISA? It:

- **Reaches** students across the curriculum AND co-curriculum.
- **Raises** the profile and importance of enterprise and entrepreneurship education in the curriculum.
- **Recognises** and helps identify student enterprise learning in academic courses.

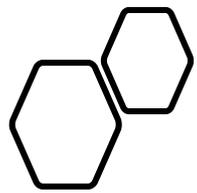


SISA Accredited Modules Include:

- PI4077: Dirty War and its Aftermath
- ED152: Learning from Work
- SM1501: The Cell
- ED2550: Career Development: Find Your Direction
- ED3536: Working Together: Employability for Arts & Social Science
- HA5032: Art and Business
- PU5548: Work-based Placement in Applied Health Sciences
- PS4042: Professional Skills and Work Experience in Psychology
- ED251A: Engineering Work Experience
- GG5055: Collaboration & Partnership Principles
- SX3002: Science & Society

External Benching Marking 2019-20

Award Level	All Scottish Institutions	University of Aberdeen
SISA: Level 1 Future Thinkers	1027	162
SISA: Level 2 Innovation Catalysts	214	30
SISA: Level 3 Innovation Champions	65	11



The Cell SM1501

- Developing Your Enterprise Skills Workshop
- Helps to develop enterprising behaviours in 300-400 first year, bioscience students and to explore examples of wicked problems.
- Task: What will the future lab of 2026 look like?
 - What if in 2026 all laboratories will use biodegradable plastic.....
 - What if in 2026 all laboratories will be required to educate the employees on the products they are using and how to dispose of them within a zero-waste cycle....



SUSTAINABLE DEVELOPMENT GOALS



Robert Gordon University (RGU) is the first university to achieve accreditation from the Scottish Innovative Student Award Scheme (SISA).

Created by the Scottish Institute for Enterprise (SIE), SISA will allow universities to deliver additional courses which equips students with a forward-thinking and enterprising business skillset.

The scheme will be delivered in modules running in tandem with students' regular degree programmes and has been designed in conjunction with three of Scotland's Innovation Centres; DataLab, Digital Health and Care Institute and CENSIS.

RGU's School of Creative and Cultural Business is the first university to receive accreditation and the students can complete Level 1 'Future Thinker' while



Whole person education

4.0

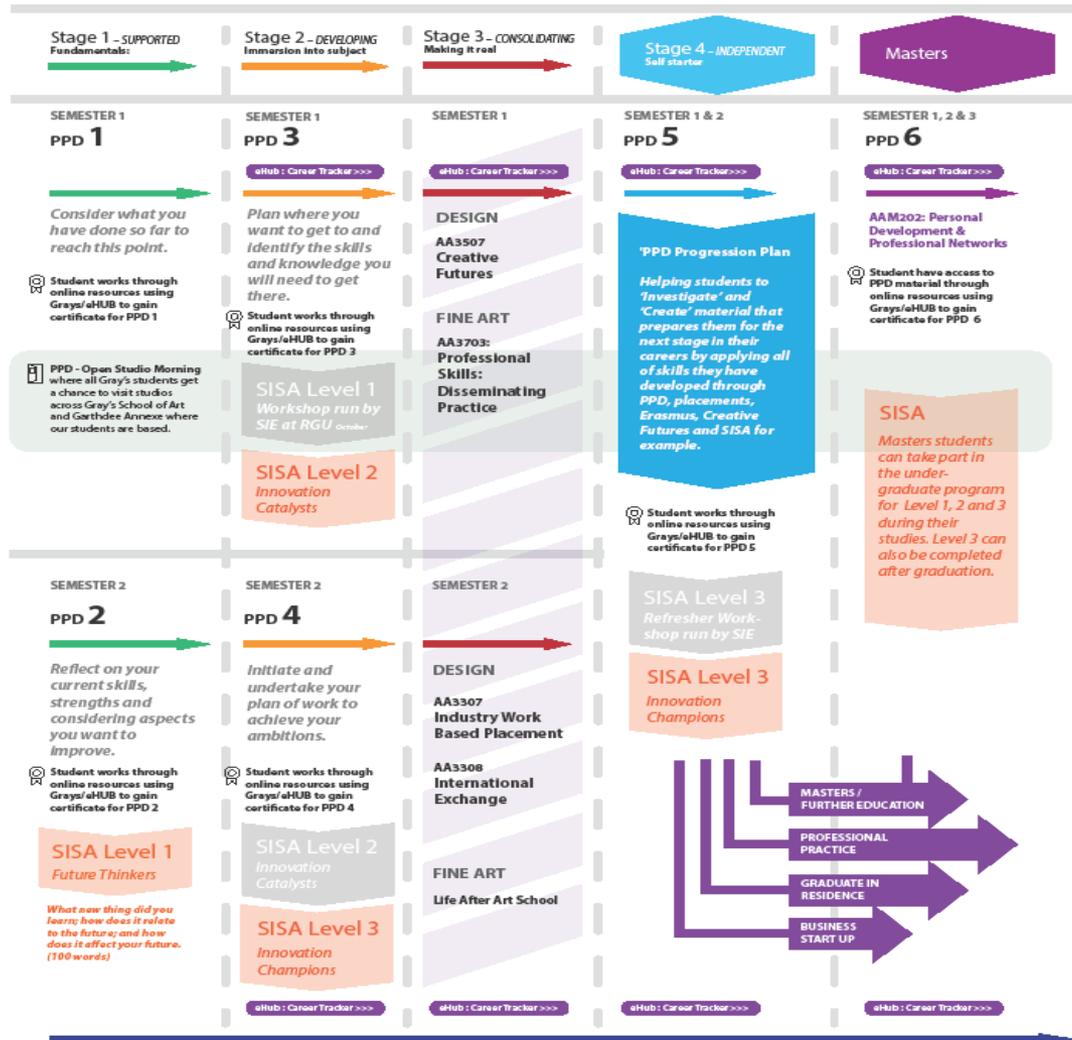
Graduate skills has increasing importance in the academic debate.

Holistic Curricula
Lifelong learning – CPD
Collaborative practices



Gray's School of Art Focus on Employability/ Enterprise / Entrepreneurship

Personal Professional Development at Gray's School of Art



My PPD Workshops – Lorraine Amies, Employability and Professional Enrichment Hub

During the course of the year the Employability and Professional Enrichment Hub also run a range of Design and Fine Art, events featuring talks and networking opportunities for all students at Gray's School of Art. This is also supported by a range of group workshops covering: Fine Artists CV, Networking (Self-Marketing), Where are the Jobs?, Creative Design CVs, Going it alone & Fine tuning yourself for the creative industries.



“During her Graduate Residency at Leith School of Art, Lauren has transferred the skills she attained through SISA programme. In this she demonstrates the ability to recognise a range of perspectives and adapt to new challenges posed by the course such as her teaching and lecturing placement. In this role she communicates effectively and applies creative problem-solving strategies whilst working with students to allow them to see new ways to develop their professional practice.”

Principal, Leith School of Art

INFORMATION FOR STAFF

For staff, being accredited can add value to your module and provide validation for your content. All that is required is to submit an RGU SISA Level 1 Accreditation Application to the Academic Quality Officer for your school. This will be reviewed by critical readers on behalf of SIE to ensure the module meets the criteria. Read the full accreditation process:

AQH 1 - SISA Level 1 Accreditation Process

PDF - 90KB

DOWNLOAD 

Once accredited, module tutors teach as normal, but introduce the award scheme to students and encourage them to apply. Once students have applied for a certificate, you'll be asked to give a successful/unsuccessful judgement based on their short reflective statements and performance on the module. Staff can find out more and access slides, resources and videos:

[→ SIE SCOTTISH INNOVATIVE STUDENT AWARDS - STAFF RESOURCES \(CAMPUSMOODLE\)](#)

“I have seen a major increase in my confidence, networking and innovation skills. I believe this programme has helped me become a more adaptable and flexible thinker, allowed me to manage my uncertainty about various ideas and how they can be turned into a more positive decision using evidence and analysis. I believe that this scheme has helped me develop the appropriate skills needed to start up my own videography company during the pandemic.”

Founder, Pink Sphinx Media



PINK
SPHYNX
MEDIA

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	Awards 2019-20			Awards 2020-21*
	RGU (inc)	Scotland	Percentage	RGU
Level 1: Future Thinkers	379 (+260)	1027	36.9%	Approx. 430
Level 2: Innovation Catalysts	57 (+39)	214	26.6%	88
Level 3: Innovation Champions	18 (+13)	65	27.7%	7

Number of Modules Accredited	24 (+13)	74	32.4%	33 (+9)
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*in academic cycle

References

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Quality Assurance Agency (2018) *Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers*. Report.
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(c) SIE 2020

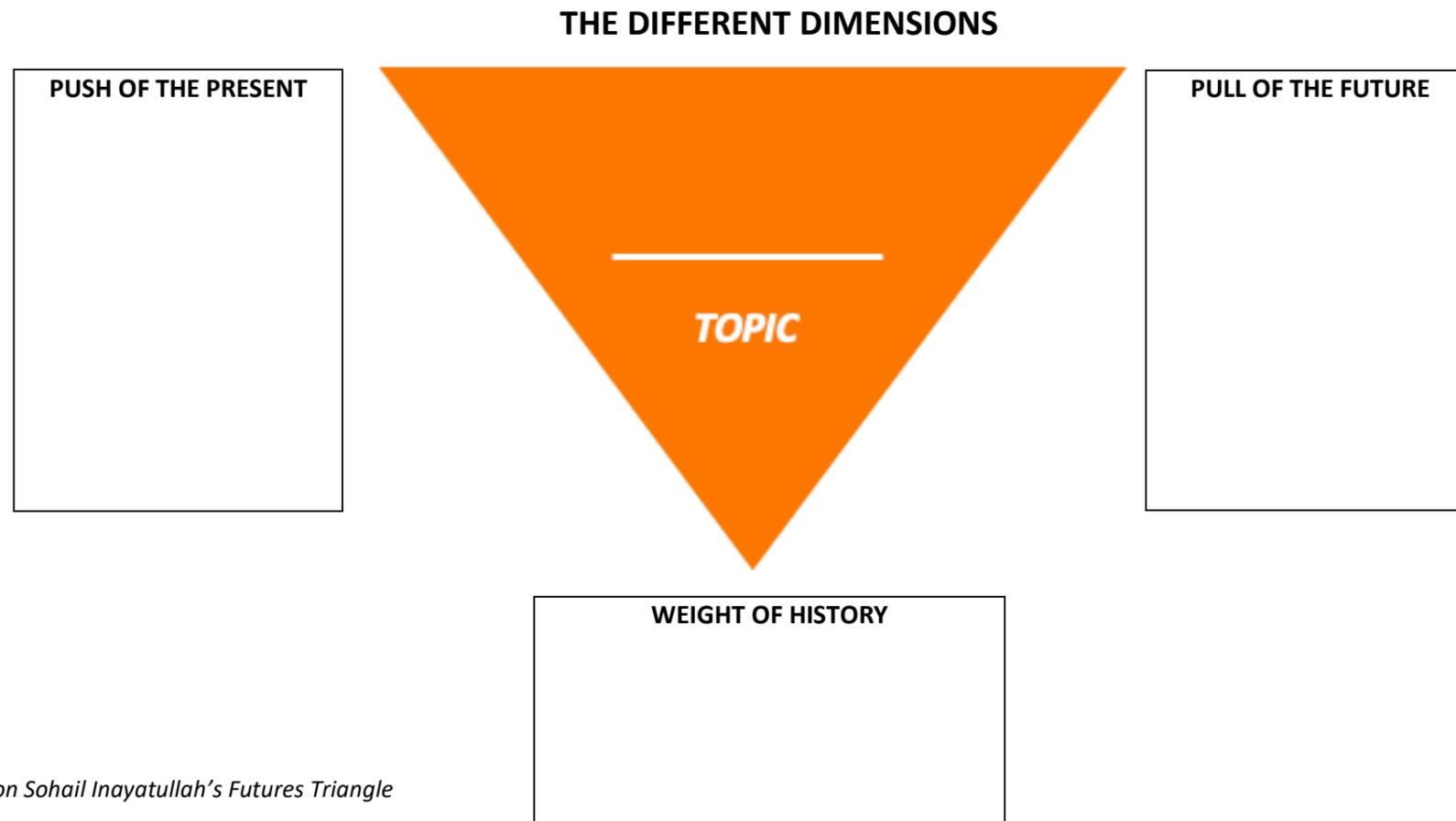
UNDERSTANDING HOW CHANGE HAPPENS

To begin the process of imagining a plausible future it is important to identify the different factors that bring about change. The future occurs over time as strong, subtle and noisy forces interact with each other in the present to influence stability and change. This exercise looks at categorising these forces into 3 dimensions or directions and then exploring how they all interact with each other to shape the speed and trajectory of change.

Use the steps in this worksheet to identify all the forces at play around a chosen topic. Once you have these mapped out you can start to identify the forces with the greatest potential to impact on this topic.

STEP 1

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**Based on Sohail Inayatullah's Futures Triangle*

DEFINITIONS

Push of the Present - Think about the big drivers of change that have the potential to drive change in a certain direction. For example, policies, technologies and changes in society. What impact will they have? Try to use drivers that have strong data to support the impact or trajectory you think they will have.

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STEP 2

Review your examples in Step 1 and identify the ones you think will have the strongest influence. Use the Key Tip box to help you assess the strength of your examples.

STEP 3

Document below the examples from each dimension that you think are going to influence significantly the future you want to imagine.

	<p><i>Push of the Present</i></p>
	<p><i>Pull of the Future</i></p>
	<p><i>Weight of History</i></p>

KEY TIP

It can help to think of the triangle as having sides made out of string or elastic that are mutually dependent on each other and can pull each other out of shape so that one dimension becomes a stronger influencer. However, the triangle never breaks. For example, what if one of the United Nations Sustainability Goals is such a strong and charismatic pull from the future that it accelerates the need for development of innovation in the present? Or what if a present day push around the social driver of an ageing population can overcome the weight of historical structures and behaviours around the need to care for the elderly in hospital to generate new innovations around their care?

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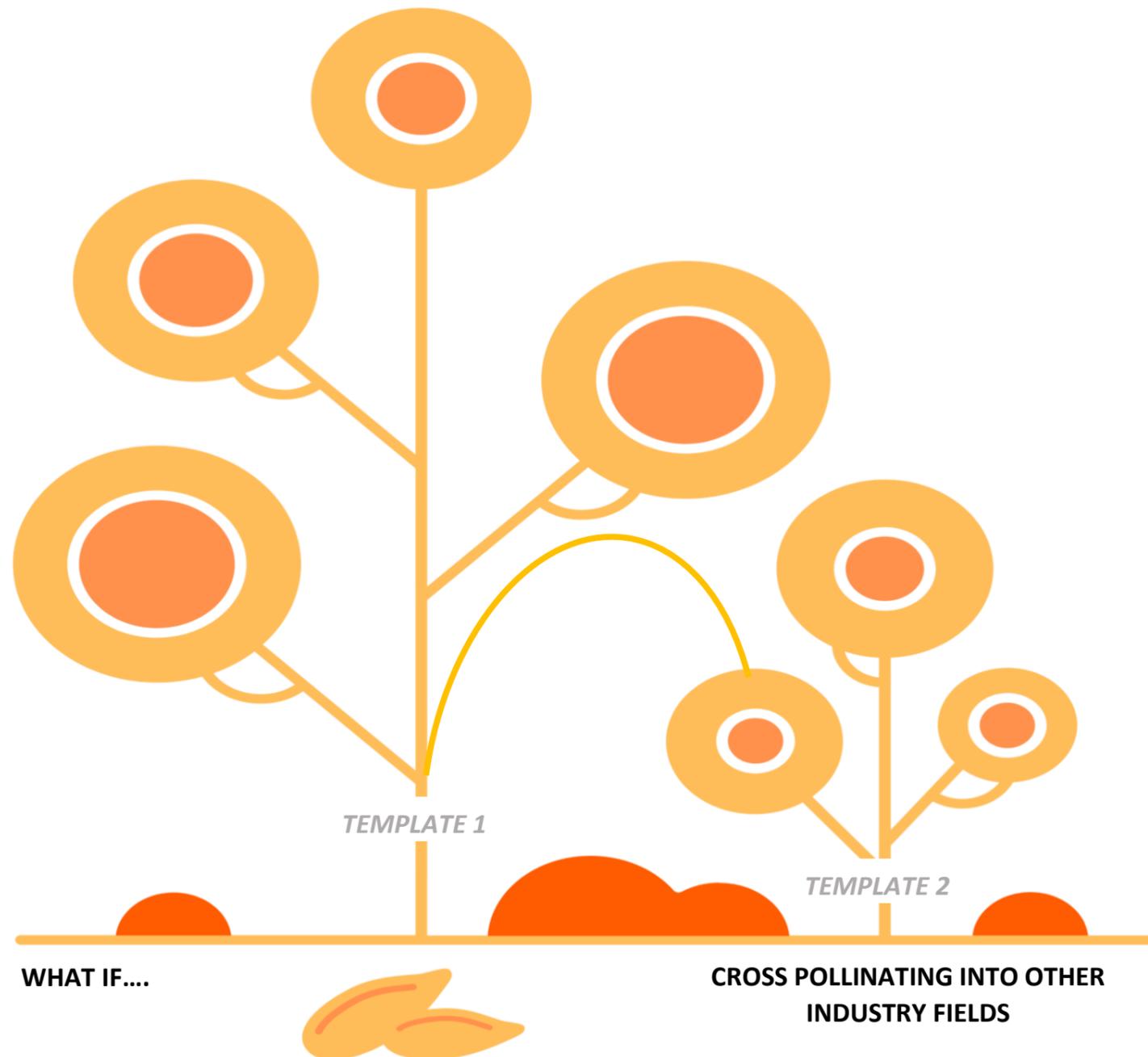
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STEP 1: Select a force for change that you think will impact on your chosen topic and then use this force to generate a short **‘What if...’** statement that describes a future world that this force could generate.

What if

in 5 years’ time?



TEMPLATE 1

TEMPLATE 2

WHAT IF....

CROSS POLLINATING INTO OTHER
INDUSTRY FIELDS

WHAT GROWS OUT OF IT TO CREATE A PLAUSIBLE FUTURE?

HOW IT WORKS

Think of your ‘what if’ statement as a seed you can plant in your imagination. What sort of future can you imagine growing from it? Populate the boxes with details of what you think will exist. You can add in more. These details can be products, services and policies. However, they can also be issues like privacy, data sharing concerns and social problems like loneliness (these are just general examples).

Plants will also pollinate other patches of ground – in this case a another industry sector. If you think your ‘what if’ statement can do this then repeat the process for TEMPLATE 2.

STEP 2: BUILDING YOUR WORLD

In a couple of lines describe a world that features what has grown out of you planting your ‘what if’ statement in your imagination. Make it short but specific - describing the products and services being used and detailing any issues this future world might have.

This is a world in which....

Experiencing the Future

TO EXPERIENCE THE FUTURE AND ITS POSSIBILITIES WE NEED TO CONNECT WITH IT EMOTIONALLY AND IN DEPTH. THIS WORKSHEET IS DESIGNED TO HELP YOU DO THAT.

Who Inhabits this Future?	What does this Future feel like for them? (e.g. friendly, chaotic, safe, calm, regulated, difficult)	What are People Doing in this Future? (e.g. supporting a family or others, building a business, contributing to a cause, building something)
What are the New Characteristics of this Future Compared with the Present Day?	What Objects are People Interacting with? (this can be brand new objects or familiar objects enhanced in some way)	

Futuring A New Offering

THIS WORKSHEET IS DESIGNED TO HELP YOU IDENTIFY A KEY TRANSFORMATION IN THE FUTURE YOU HAVE JUST EXPLORED. THEN TO USE THIS TRANSFORMATION TO SPOT AN OPPORTUNITY FOR INNOVATION THAT YOU CAN ACTION IN THE PRESENT DAY THAT IMPACTS ON THIS TRANSFORMATION.

1. Transformation	2. Key Opportunity	3. Your New Idea or Offering that Belongs in This Future

4. The Impact You Think It Could Have	5. Possible Revenue Streams