# Project Ideas for DAT257

The focus is on practising Git and Agile Workflow, not to invent a spaceship.

Hans-Martin Heyn, Universitetslektor, 2023

# Background: The 17 Sustainable Development Goals of the United Nations



- Adopted by all UN Member states in 2015

- "Shared blueprint for peace and prosperity"

- Process started in 1992 at the Earth Summit in Rio de Janeiro

- Includes 169 targets
  - The aim is to achieve most of these targets by 2030!!

## 1 NO POVERTY

# END POVERTY IN ALL ITS FORMS EVERYWHERE

- Poverty is defined as income less than 1.25 USD / day
  - Sweden has an average income of ~104 USD/ day!

- Targets include:
  - Poor people are not vulnerable to climate change
  - Equal rights to economic resources
  - Sustainable jobs and job equality
  - Eradicate extreme poverty by 2030

RISING INFLATION AND IMPACTS OF WAR IN UKRAINE **FURTHER DERAIL PROGRESS**

NUMBER OF PEOPLE LIVING IN EXTREME POVERTY IN 2022

581 MILLION
PRE-PANDEMIC PROJECTION

657-676 MILLION
CURRENT PROJECTION

## END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

- Mostly women and children suffer from hunger and malnutrition

- Targets include:
  - Eradication of all hunger and malnutrition in the world
  - Protecting small farmers
  - Protecting genetic diversity in crops
  - Research to make farming more productive
  - Reduce drastically waste of food

**SOARING FOOD PRICES**
AFFECTED

47%

OF COUNTRIES IN 2020
(UP FROM 16% IN 2019)

## 3 GOOD HEALTH AND WELL-BEING

## ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES

- Promoting well-being for all ages

- Targets include:
  - Universal health coverage
  - Increasing healthcare workforce
  - Reducing illness and death by pollution
  - Tackling a wide range of global health challenges such as AIDS, Malaria, Tuberculosis
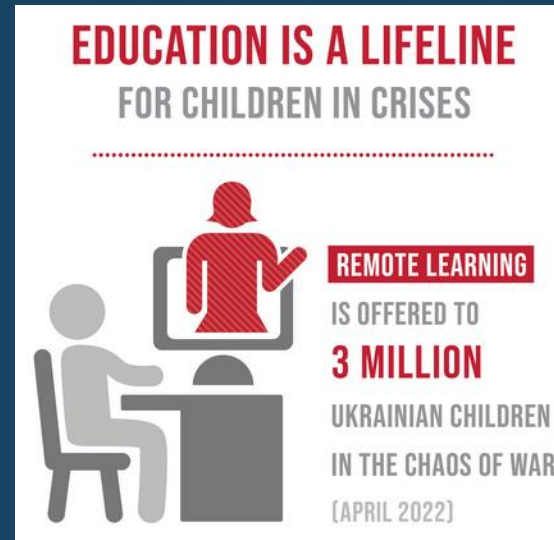  - Promote vaccinations

**22.7 MILLION** CHILDREN MISSED BASIC VACCINES IN **2020**

**3.7 MILLION** MORE THAN IN **2019**
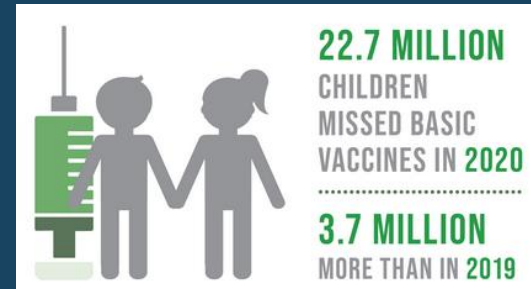
**4 QUALITY EDUCATION**

**ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL**

- Obtaining quality education for everyone, independent of their financial or social status

- Targets include:
    - Access to university
    - Vocational (on-the-job) trainings
    - Promote entrepreneurial skills
    - Help children to read

**EDUCATION IS A LIFELINE**
FOR CHILDREN IN CRISES

**REMOTE LEARNING** IS OFFERED TO **3 MILLION** UKRAINIAN CHILDREN IN THE CHAOS OF WAR

[APRIL 2022]

# ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

- Gender equality is a necessary foundation for a peaceful, prosperous and sustainable world.

- Targets include:
  - Freedom from discrimination and violence
  - Equal share of leadership opportunities
  - Equal share in property ownerships
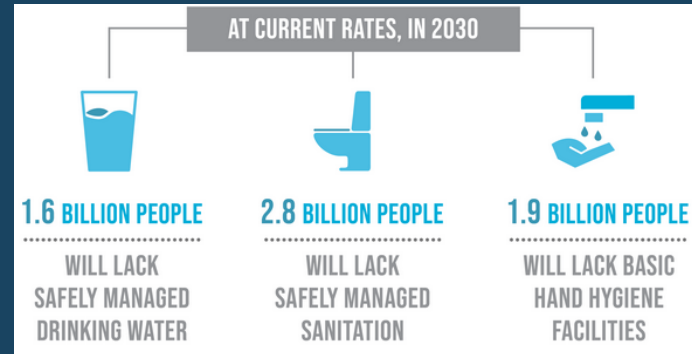  - Eliminate sexist language and behaviour

**MORE THAN 1 IN 4 WOMEN** (15+ YEARS)

HAVE BEEN SUBJECTED TO INTIMATE **PARTNER VIOLENCE** (641 MILLION) AT LEAST ONCE IN THEIR **LIFETIME**

**6 CLEAN WATER AND SANITATION**

# ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

- Clean, accessible wataer for all
  - 40% of world population has not access to clean water!!

- Targets include:
  - Access to basic technologies like toilets
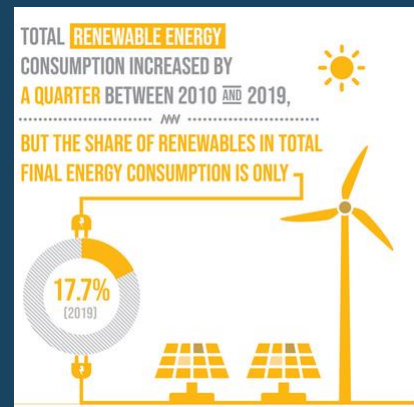  - Protecting ecosystems that provide water
  - Reduce waste of water

**AT CURRENT RATES, IN 2030**

**1.6 BILLION PEOPLE** WILL LACK SAFELY MANAGED DRINKING WATER

**2.8 BILLION PEOPLE** WILL LACK SAFELY MANAGED SANITATION

**1.9 BILLION PEOPLE** WILL LACK BASIC HAND HYGIENE FACILITIES

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**7 AFFORDABLE AND CLEAN ENERGY**

## ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

- Energy is a central and major challenge, but also opportunity towards a sustainable world
  - 1.3 billion people around the world have currently no access to (reliable) electricity.

- Targets include:
  - Conversion to renewable energy sources
  - Dramatic improvement in energy efficiency

TOTAL RENEWABLE ENERGY CONSUMPTION INCREASED BY A QUARTER BETWEEN 2010 AND 2019, BUT THE SHARE OF RENEWABLES IN TOTAL FINAL ENERGY CONSUMPTION IS ONLY

17.7% [2019]

2.4 BILLION PEOPLE

STILL USE INEFFICIENT AND POLLUTING COOKING SYSTEMS [2020]

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**8 DECENT WORK AND ECONOMIC GROWTH**

**PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL**

- Sustainable economic growth will require working conditions that allow people to have quality jobs

- Economic growth must not rely on ecosystem degradation.

- Targets include:
  - Reduce unemployment
  - Eliminate child labour
  - Achive more productivity through diversification
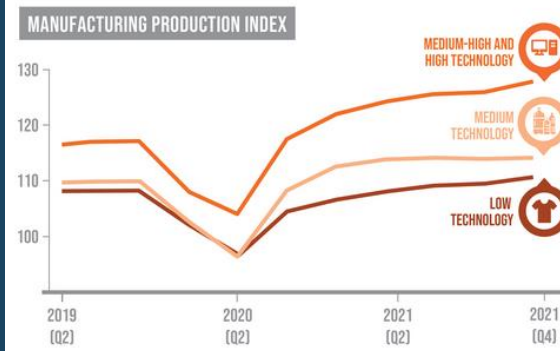  - Full and productive employment and equal pay  independent of sex and health status

**1 IN 10** CHILDREN ARE ENGAGED

IN CHILD LABOUR WORLDWIDE

**160 MILLION TOTAL CHILDREN** (2020)
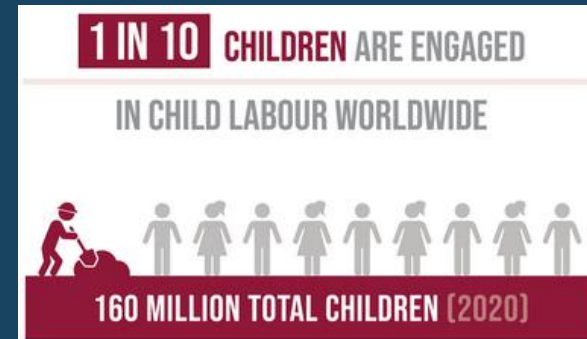
**9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**

## BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

- Infrastructure and sustainable industrial development is crucial to achieve sustainable development

- Targets include:
  - Fostering more innovative and environmentally sound approach to industrial development
  - New ways to repurpose old material (Circular Economy)
  - Increase access to information and communications technology in least developed countries



**HIGHER-TECHNOLOGY INDUSTRIES** ARE FAR MORE RESILIENT IN CRISES THAN THEIR LOWER-TECH COUNTERPARTS

MANUFACTURING PRODUCTION INDEX

MEDIUM-HIGH AND HIGH TECHNOLOGY

MEDIUM TECHNOLOGY

LOW TECHNOLOGY

2019 (Q2) — 2020 (Q2) — 2021 (Q2) — 2021 (Q4)

## 10 REDUCED INEQUALITIES

# REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

- The world is massively unequal!

- More attention is needed to include disadvantaged and marginalised populations.

- Targets include:
  - Income growth of the bottom 40% of the population at a higher rate than the national average
  - Improve the regulation and monitoring of global financial markets
  - Facilitate safe, fair, regular and responsible migration and mobility of people



1 IN 5

PEOPLE HAVE EXPERIENCED

DISCRIMINATION

ON AT LEAST ONE OF THE GROUNDS PROHIBITED UNDER INTERNATIONAL HUMAN RIGHTS LAW

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**11 SUSTAINABLE CITIES AND COMMUNITIES**

## MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

- Cities need to provide opportunities for all
  - More than half of the world populaton lives in cities.

- Targets include:
  - Establish sustainable transportation
  - Disaster preparedness
  - Preservaton of cultural and natural heritage
  - Keep city air clean

**99%** OF THE WORLD'S URBAN POPULATION BREATHE POLLUTED AIR

ACCORDING TO NEW WORLD HEALTH ORGANIZATION AIR QUALITY GUIDELINES OF PM$_{2.5}$ <5 UG/M$^3$

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# ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

**12 RESPONSIBLE CONSUMPTION AND PRODUCTION**

- Reduce waste and improve sustainable conspution
  - Majority of electronic waste is not being safely or sustainably recycled / handled.

- Targets include:
  - Halve per capita global food waste at retail and consumer level
  - Environmentally sound management of chemicals and all waste throughout their life cycle
  - Redunce waste generation

**VAST MAJORITY** OF THE **WORLD'S ELECTRONIC WASTE IS** **NOT BEING SAFELY MANAGED**

E-WASTE COLLECTION RATES (2019)

| 1.2% | 1.6% |
|---|---|
| LATIN AMERICA AND THE CARIBBEAN | SUB-SAHARAN AFRICA |
| 46.9% | 22.8% |
| EUROPE AND NORTHERN AMERICA | GLOBAL AVERAGE |

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**13 CLIMATE ACTION**

# TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

- Climate change affects everyone, everywhere!
  - Limit global warming to max. 2 degrees C.

- Targets include:
  - Integrate climate change measures into national policies and planning
  - Improve education and awareness of climate change and its consequences
  - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries
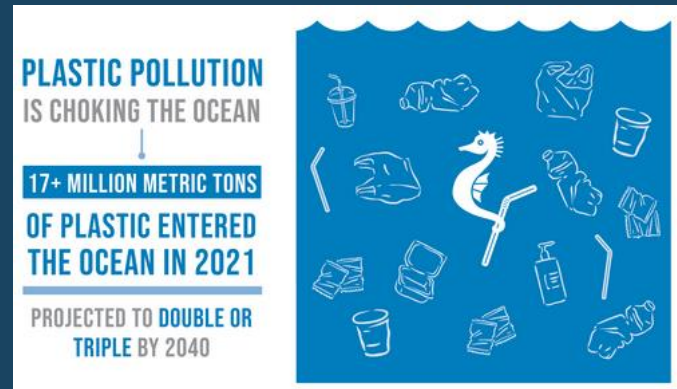
RISING GLOBAL TEMPERATURES CONTINUE UNABATED, LEADING TO **MORE EXTREME WEATHER**

1850  1875  1900  1925  1950  1975  2000  2021

**14 LIFE BELOW WATER**
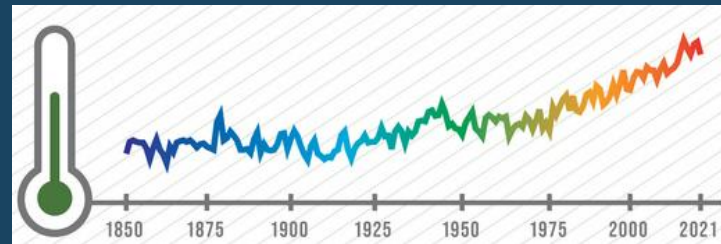
## CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

- World's oceans are overfished, under-protected and stressed from climate change

- Targets include:
  - Research and learning about what lies beneath the oceans
  - Reduction of plastic waste ending up in the oceans
  - Prevent marine pollution of all kinds
  - Prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing.

**PLASTIC POLLUTION** IS CHOKING THE OCEAN

**17+ MILLION METRIC TONS** OF PLASTIC ENTERED THE OCEAN IN 2021

PROJECTED TO **DOUBLE OR TRIPLE** BY 2040

**15 LIFE ON LAND**

PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

- Sustainably manage forests, combat desertificaton, stop land degradation, and halt biodiversity loss.

- Targets include:
  - Restoration of freshwater ecosystems
  - Sustainable forst management
  - Restore degraded land and soil, prevent desertificaton
  - Protect biodiversity



AROUND **40,000 SPECIES** ARE DOCUMENTED TO BE **AT RISK** OF **EXTINCTION** OVER THE COMING DECADES

**16 PEACE, JUSTICE AND STRONG INSTITUTIONS**

**PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE AND INCLUSIVE INSTITUTIONS AT ALL LEVELS**

- Access to justice for all through effective, accountable, and fair institutions at all levels

- Targets include:
  - Reduction of violence
  - Total end of torture
  - Reduction of corruption
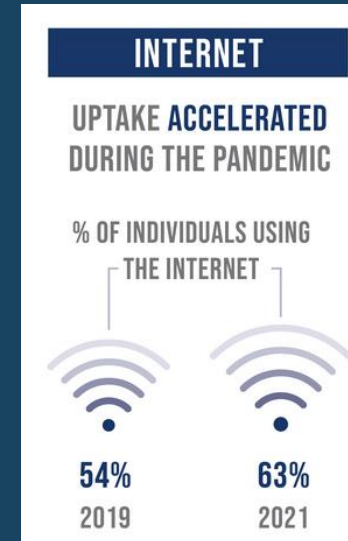  - Institutions and governments that work for everyone

**1/3** OF THE WORLD'S POPULATION

**MOSTLY WOMEN**

**FEAR WALKING ALONE** IN

THEIR NEIGHBOURHOODS AT NIGHT

**17 PARTNERSHIPS FOR THE GOALS**

## STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

- Every country and every sector has a role to play in achieving the SDGs.

- Targets include:
  - International support for developing countries
  - Assist developing countries in attaining long-term debt sustainability
  - Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms.

**INTERNET**

UPTAKE **ACCELERATED** DURING THE PANDEMIC

% OF INDIVIDUALS USING THE INTERNET

54% 2019

63% 2021

# What can we do in our project to promote or align with the SDGs?



- Sustainable Transport in Göteborg Region:

- https://developer.vasttrafik.se/portal//#/



- Sustainable Transport in Sweden (Road, Rail, etc.): Trafikverkets API

- https://api.trafikinfo.trafikverket.se/

# What can we do in our project to promote or align with the SDGs?


**7 AFFORDABLE AND CLEAN ENERGY — ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL**

- Energy Consumption in Sweden
- https://www.energimyndigheten.se/statistik/

- European Electricity Production and Market
- https://transparency.entsoe.eu/

# What can we do in our project to promote or align with the SDGs?



END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

- Food statistics in Sweden

- https://www.scb.se/hitta-statistik/statistik-efter-amne/jord-och-skogsbruk-fiske/amnesovergripande-statistik/livsmedelsstatistik/


- Swedish Food Agency:

- https://www.livsmedelsverket.se/

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# What can we do in our project to promote or align with the SDGs?



15 LIFE ON LAND

PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

- European spatial data

- https://inspire-geoportal.ec.europa.eu/#


- Forest Monitoring

- https://www.globalforestwatch.org/

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# What can we do in our project to promote or align with the SDGs?


**13 CLIMATE ACTION** — TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

- Environmental data from Swedish Environmental Agency

- https://www.naturvardsverket.se/verktyg-och-tjanster/data-databaser-och-sokregister/oppna-data-fran-naturvardsverket/


- Environmental data from European Environmental Agency

- https://www.eea.europa.eu/data-and-maps

# What do we expect in the project?

- No perfect product is expected in the end!

- **Instead: Focus on how you develop your product.**

- By now you should have found a team, drafted a social contract, and created an empty git repository.

# Phase 1 of Project: Find a scope

| Week | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Project | Team | Git Account | Scope | 1st Sprint | 2nd Sprint | 3rd Sprint | 4th Sprint | 5th Sprint | 6th Sprint | Video | Report |
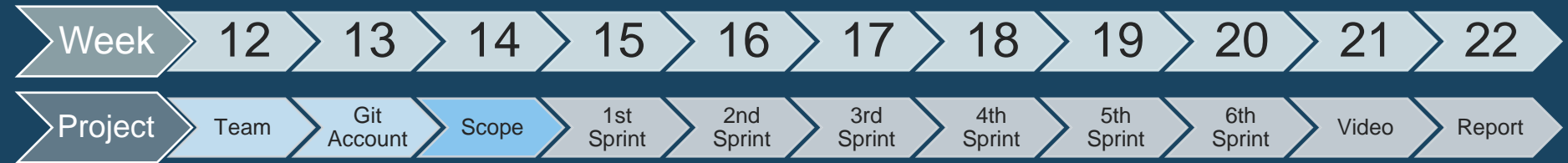
## The initial project phase

- Step 1: Setup a Team
- Step 2: Create a Git account
- **Step 3: Define a project (more next week)**

# How to find a good scope

- Don't make it too complicated.

- Start with an easy idea, and extend it gradually over the period of 6 weeks.
    - Align it with the UN SDGs. How does your idea fit to any of the targets? Be creative!

- Try out different APIs and project ideas, select the most "fun" and easy to use.

- **Keep in mind, you must be able to produce a running prototype within one sprint (i.e., one week), even if it is only a very (very) simple first product.**

# Project Scope Deliverable

## Project Scope

✎ Edit ⋮

Please submit the initial version of your project scope here. You can either submit a URL to the file in your repository (make sure it's publicly accessible) or a PDF. You can also copy and paste your social contract here as a text entry.

This assignment must contain a description of your project scope using a model canvas or visual / textual mockup. This deliverable consists of two parts:

1. Upload a description, the business model canvas or a mockup, i.e., a visual or textual representation of what you imagine your product / software shall look like, to your repository and here as .pdf;
2. Describe in the .pdf file in 200-500 words how your project aligns to one of the UN Sustainability Goals. Feel free to refer to any of the (sub) targets.
3. **Create a post in the discussion forum that contains the description of your project scope**. The description **does not have to include** a differentiating factor compared to already posted descriptions (i.e. two teams can develop applications based on the same idea). This is a change from previous years.

| | |
|---|---|
| **Points** | 0 |
| **Submitting** | a file upload |
| **File types** | pdf |

| Due | For | Available from | Until |
|---|---|---|---|
| 7 Apr at 17:00 | Everyone | - | - |

+ Rubric

# An example from last year

- A new way for companies to collect information from their employees allowing individuals to record their well-being and analyze as well as reflect on it in a chosen period.

- The project started as only creating the interface of the application. New features were then added for each sprint.
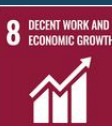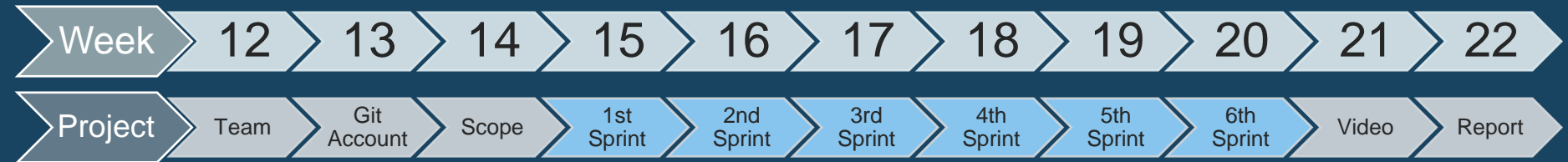


**8 DECENT WORK AND ECONOMIC GROWTH**

**PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL**

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# Select a product owner (PO)

- The product owner can be part of the development team.
  - You can rotate after each sprint if you want.

- The PO ensures that the product is developed according to the "customers" expectations.

- Obviously we do not have a customer, so you (as PO) have to "interpolate" the customer's expectations.
  - Define expectations: What does the (imaginary) customer expect? What are the initial expectations?

- The TA assigned to your team will mimic a customer from time to time and request changes or ask why you made certain design decisions. Be prepared for that.

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# Phase 2 of Project: Development

| Week | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|

| Project | Team | Git Account | Scope | 1st Sprint | 2nd Sprint | 3rd Sprint | 4th Sprint | 5th Sprint | 6th Sprint | Video | Report |
|---|---|---|---|---|---|---|---|---|---|---|---|

## The development phase

- Step 4: for sprint n=1…6
  - Step 4a: Quickly develop something working
  - Step 4b: Test it
  - Step 4c: Refine the idea, add new features

# Working in Sprints 1/2

- The product shall after each sprint be in a working order
  - After each sprint, the customer could request to "launch" the product into the market.

- Have a sprint planning before each sprint. Define goals/stories for your Kanban board.

- When you run out of goals/stories, have another planning meeting and create more.

- At the end of each sprint, the product owner (and/or your TA) defines new ideas / goals for your product.

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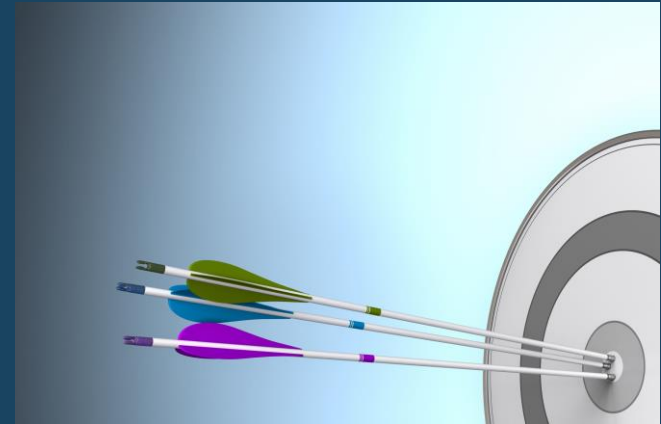
# Working in Sprints 2/2

- In each sprint, I want you to take (at least) 2 screenshots of your Kanban board: Just after sprint planning, and in the middle of the sprint.

- Feel free to take more (e.g., every time you work on the project)

- Make use of GitHub / GitLab if you like, e.g., use branching and integrated Kanban board.
  - Describe the use of GitHub / GitLab in your report.
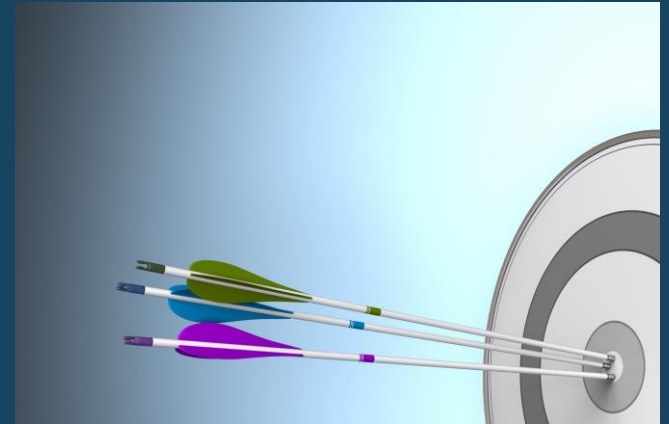
# Reporting the sprints (every week!)

## Team Reflection Sprint1

✓ Published   ✎ Edit   ⋮

Please submit your team reflection for Sprint 1 here as a text file in .txt or .md format, or a PDF.

You shall reflect on the following aspects:

- How is your team work? Does it work well? Can you improve?
- How do you ensure that your software is of good quality? Any measures you have taken (e.g., pair programming / checking, test procedures, etc?)
- What features did you implement in this sprint?
- What are your plans for the upcoming sprint?

The report shall be not longer than 1 page.

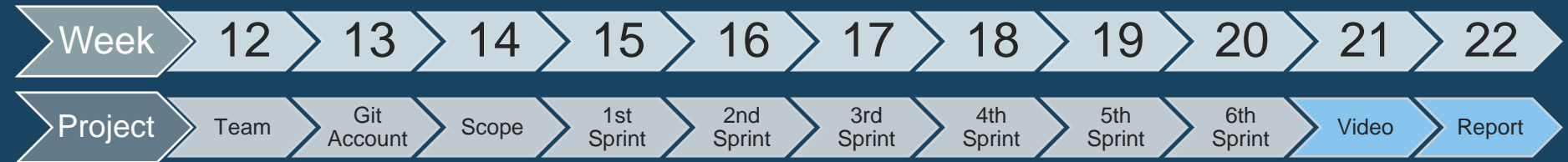**The report shall contain screenshots (minimum 2) of your Kanban board before and in the middle of the sprint.**

| | |
|---|---|
| **Points** | 0 |
| **Submitting** | a text entry box or a file upload |
| **File types** | pdf, txt, and md |

| Due | For | Available from | Until |
|---|---|---|---|
| 14 Apr at 17:00 | Everyone | - | - |

+ Rubric

# Phase 3 of Project: Wrap-Up

| Week | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|------|----|----|----|----|----|----|----|----|----|----|----|
| Project | Team | Git Account | Scope | 1st Sprint | 2nd Sprint | 3rd Sprint | 4th Sprint | 5th Sprint | 6th Sprint | Video | Report |

## The wrap-up phase

- Step 5: Create a presentation video
- Step 6: Write a report
- Step 7: Do peer-assessment individually

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# The video presentation

Video Uploaded                    ✓ Published    ✏ Edit    ⋮

Upload here a video that describes your project idea and outcome.

The video shall 3-5 minutes long. It shall contain

- A pitch of your idea,
- A timelapse of all Kanban screenshots,
- A presentation of the final product / software.

| | |
|---|---|
| Points | 0 |
| Submitting | a website url, a media recording, or a file upload |

| Due | For | Available from | Until |
|---|---|---|---|
| 22 May at 10:00 | Everyone | - | - |

+ Rubric

- The video will be published on Canvas for everyone to see (as part of the discussion thread you created in the beginning)
  - It shall be between 3-5 minutes long.

- Pitch your idea (elevator pitch)

- Timelapse of the Kanban screenshots from all sprints

- A brief final presentation / walk-through of your final product.

# The final report

**Final Report**

✅ Published    ✎ Edit   ⋮

Please submit your final report for the overall course here. The final report is a reflection by the entire team that encompasses what you did, your goals for the next such project, and how you achieve this goal. You can submit a text file in .txt or .md format, or a PDF.

As a team you should reflect on the topics discussed in the lecture (i.e., how to work as a team, Scrum and Software Quality, Building a Product).

The report should summarise and synthesise the learning from the project as a whole (Step A: "what is"), describe what you would like to do in a similar future project (Step B "what might or should be") and how you can make the change come true (Step C: "feedback designed to reduce the gap"). We will also have a look at the reflections from previous iterations (sprints) to see if your chain of reflection is complete.

**The report shall not be longer than 5 pages.** Refer as often as possible to examples taken from your project development (e.g., describe when you faced a challenge and how you solved it using techniques you learned in this course).

| | |
|---|---|
| Points | 0 |
| Submitting | a text entry box or a file upload |
| File types | pdf, txt, and md |

| Due | For | Available from | Until |
|---|---|---|---|
| 2 Jun at 17:00 | Everyone | - | - |

- Unlike the sprint reports, here you are asked to summarise and synthesise what you learned throughout this course and your project.
  - Step A: Learning from the course and project as a whole
  - Step B: Describe what you would like to do in a similar future project (or when working in an agile team in a company).
  - Step C: How can you achieve this?

- Refer to examples from your project work and experience in your team.

- The report shall not be longer than 5 pages.

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# Peer Assessment



- Finally, you will have to fill out a peer assessment.

- The background is that we need to check that everyone in the team was involved and did not "catch a free ride" with one of the teams.

- If you encounter problems in your team that you cannot solve yourself, please contact us ASAP (your TA, or either Jonas or Hans-Martin).
  - Don't wait too long to solve problems in your teams.

# Find more information and inspiration

General information, including targets for each goal

https://sdgs.un.org/goals

Bringing data to life: SDG Human Impact stories

https://unstats.un.org/sdgs/report/2022/SDG2022_Flipbook_final.pdf

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