TU Delft Strategic Plan Open Science 2020-2024

Research and Education in the Open Era

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Research and Education in the Open Era

TU Delft Strategic Plan Open Science 2020-2024

TUDelft

Research and Education in the Open Era

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Management Summary

Open Science is creating new forms of scientific interaction that were impossible or undreamed of in an earlier age. This has a strong impact on core academic processes like research, education and innovation. It is, for instance, easier to replicate an experiment if the relevant data sets are digitally available to any scientist who wishes to corroborate her colleague's findings.

TU Delft has a long history of engagement with Open Science. Yet, with its *Open Science Programme 2020-2024, Research and Education in the Open Era*, TU Delft wishes to take Open Science to the next level: a situation in which Open Science has become the default way of practising research and education, and the "information era" has become the "open era". It is TU Delft's ambition to be frontrunner in this revolutionary process. This is reflected in the *TU Delft Strategic Framework 2018-2024*, with "openness" as one of its major principles.

The *TU Delft Open Science Programme 2020-2024* tackles all areas of scholarly engagement where restrictions limit the flow of academic knowledge. It proposes new approaches to the process of research, education and innovation, with a strong focus on transparency, integrity and efficiency.

The programme consists of five interrelated projects: Open Education, Open Access, Open Publishing Platform, FAIR Data, and FAIR Software. The projects are aimed at creating and disseminating various types of resources for the benefit of TU Delft researchers, teachers and students, as well as the general public. They will range from educational materials and software to a publishing platform. All outputs of the programme will be as 'FAIR' as possible: findable, accessible, interoperable and reusable.

Each project will address three preconditions for successful implementation: ensuring appropriate rewards and recognition, facilitating fruitful collaboration with third parties, and gathering relevant skills. These are therefore incorporated in the programme as cross-cutting themes for all five projects.

The *TU Delft Open Science Programme 2020-2024* will be coordinated by a steering committee, under the responsibility of VRM Rob Mudde, and will be managed by a programme team. Chair of the steering committee is Wilma van Wezenbeek, director of TU Delft Library. The other steering committee members are Jan Dirk Jansen, Dean of the Faculty of Civil Engineering and Geosciences (representing all faculties); Paul Hillman, director of ICT/FM (representing all university services); and Irene Haslinger, who also chairs the programme team. Faculties and university services are represented by project leaders in and/or liaisons to the programme team. The steering committee will report to the Executive Board at least once a year, when a work plan has been completed and next year's work plan will be presented.

2

Research and Education in the Open Era

2a. Vision and ambition

The first scientific revolution, with breakthroughs in the areas of physics, astronomy, chemistry and biology, transformed our view of nature. Similarly, over the past decades, breakthroughs in digital technology, like the microchip, the computer, and the internet have transformed the way in which we handle information. This digital revolution, leading to the present “information era”, not only affects society as a whole, but also the academic community in particular.

Digital technologies enable knowledge to flow more freely. As such, they have a strong impact on core academic processes like research, education and innovation. It is, for instance, easier to replicate an experiment if the relevant data sets are digitally available to any scientist who wishes to corroborate her colleague’s findings. Replicability increases transparency, the natural antidote to those situations in which the credibility of science is under threat. Academia itself can thus play a significant role in reversing the increasingly pronounced societal tendency of dismissing scientific results as opinions or fake news.

Open Science represents all efforts to create a scientific process based on collaboration and diffusing knowledge by digital technologies. TU Delft has a long history of engagement with Open Science. Yet, with its *Open Science Programme 2020-2024, Research and Education in the Open Era*, TU Delft wishes to take Open Science to the next level: a situation in which Open Science has become the default way of practising research and education, and the “information era” has become the “open era”. It is TU Delft’s ambition to be frontrunner in this revolutionary process. This is also reflected in the *TU Delft Strategic Framework 2018-2024*, with “openness” as one of its major principles. Open Science goes beyond free sharing of research methods

and results. It involves, for example, open textbooks and other educational output, appropriate rewards and recognition, and facilitating fruitful collaboration with third parties. Therefore, it affects the heart of the current academic system and all those who take part in it. This *Open Science Programme 2020-2024* is also important for TU Delft to align with and contribute to the National Platform Open Science.

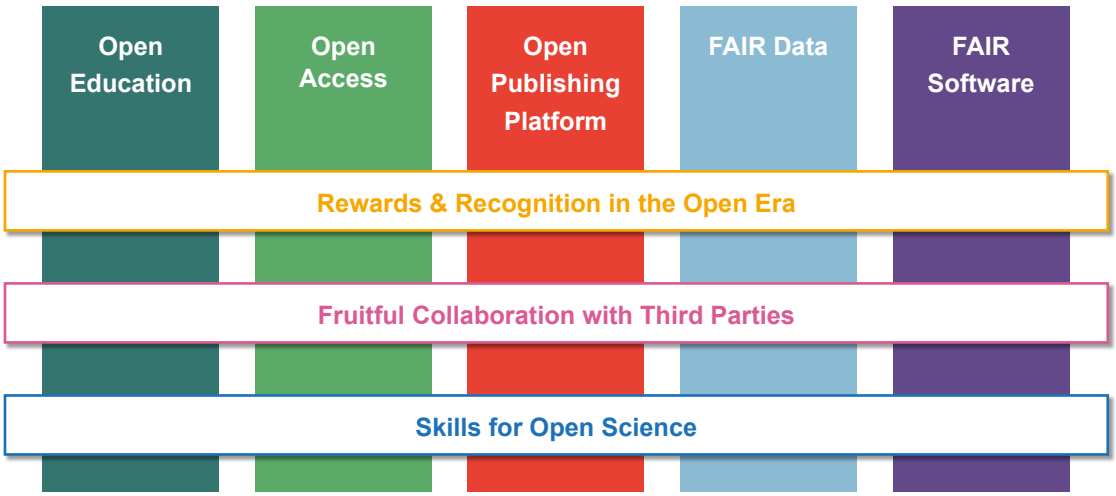
The *Open Science Programme 2020-2024* tackles all areas of scholarly engagement where restrictions limit the flow of academic knowledge. It proposes new approaches to the process of research, education and innovation, with a strong focus on transparency, integrity and efficiency.

The programme consists of five interrelated projects: Open Education, Open Access, Open Publishing Platform, FAIR Data, and FAIR Software. The projects are aimed at creating and disseminating various types of resources for the benefit of TU Delft researchers, teachers and students, as well as the general public. They will range from educational materials and software to a publishing platform. The outputs of the programme will be as 'FAIR' as possible: findable, accessible, interoperable and reusable.

In addition, each project will address the following three preconditions for successful implementation: ensuring appropriate rewards and recognition, facilitating fruitful collaboration with third parties, and gathering relevant skills. These are therefore incorporated in the programme as cross-cutting themes for all five projects.

2b. Projects and cross-cutting themes

The structure of the *TU Delft Open Science Programme 2020-2024* is depicted below. It consists of five projects and three cross-cutting themes. In this section, each of them is briefly described. A more detailed description of the projects' deliverables, including their interdependencies and a risk assessment at project level, can be found in the full project dossier (Appendix A).



Projects

Open Education: Increasing Open Educational Resources

The project supports teachers in adopting and adapting teaching and learning methods through open education. It also helps to keep education accessible and affordable for students. The project builds on current practices such as Open Courseware and MOOCs. Support includes training, advice, tools and infrastructures, for instance for sharing and reusing teaching materials.

Key deliverables: centralized helpdesk for teachers, e.g. training, copyright and open licenses (2020), open textbooks (2021), (an inventory for the) transition from commercial textbooks to open resources (2022-2024).

Open Access: Going Forward with Open Access

In the coming years, the focus of Open Access will be extended from peer-reviewed scientific articles to books, conference proceedings, book chapters, reports, reviews and educational resources. The project supports this development by addressing both policy and infrastructure aspects that are crucial to the further development of Open Access practices.

Key deliverables: adjustment and extension of TU Delft's Open Access policy (2020), 10 successful use cases of transformative deals (2020-2022), implementation of Open Access dashboard (2021), implementation of 'Taverne' (2020) and Plan S (2021-2024).

Open Publishing Platform: Open Publishing on a TU Delft Platform

Open Publishing is a form of scholarly communication that offers not only free access to scientific publications, research data and educational materials, but also provides the infrastructure and processes for creating open content. Open publishing infrastructures use open source software wherever possible, thus reducing the intrinsic costs of the publishing process. The project will deliver a publishing platform, as well as services that enable TU Delft researchers and teachers to adopt the open publishing principle.

Key deliverables: launch publishing platform TU Delft Open (2020), guide to open publishing of research and educational output (2020), implementation of various platform innovations and services, e.g. (peer) review and open post publication commentary (2020-2022).

FAIR Data: making research data FAIR

The project creates a stronger bridge between the current policy, infrastructure and culture of data stewardship and scientific practice, for instance by exploring new roles like data manager, in order to fulfill the researchers' actual needs in managing their research data. A coherent approach to FAIR data, which also takes into account the limits to open data, helps make research more transparent and efficient.

Key deliverables: FAIR disciplinary guidelines (2021), data hubs for specific disciplines (2020-2021), suite of courses (2020-2022), completed pilot data managers (2022), strategic plan for sustaining data managers at TU Delft (2022-2023).

FAIR Software: making research software FAIR

Research software is fundamental to contemporary research, particularly in the context of reproducibility. If Open Science is to contribute to better and more transparent research, then research software needs to be treated with the same diligence and accuracy as research publications and research data. The project will contribute to this goal by developing and facilitating various aspects of research software, including policy, infrastructure and organizational culture.

Key deliverables: completed pilot coding assistant (2020), completed and implemented (open) software policy (2020), curriculum for software development skills (2020), guidelines for creating, handling and archiving software (2022), completed pilot for research software engineers (2022), a strategic plan for sustaining research software engineers at TU Delft (2022-2023).

Cross-cutting themes

Rewards & Recognition in the Open Era

To encourage the actual practice of Open Science principles, it is imperative that researchers and teachers are rewarded and recognized for their efforts. This cross-cutting theme will support the development of tools and initiatives that acknowledge activities and behaviours that contribute to all dimensions of Open Science practices, which will lead also to a significant cultural change.

Key deliverables: baseline assessment of climate at TU Delft regarding rewards and incentives for Open Science (2020), overview of changes and incentives in rewards and recognition systems in the outside world (2020), implementation plan (2020-2023) for (a) incorporation of Open Science in TU Delft criteria for hiring and promotion, including recognition of engagement with Open Science in the R&D cycle, (b) TU Delft policy for differentiation in career paths that is aligned with the VSNU Position Paper on rewards and recognition, (c) development of alternative methods for research assessment.

Fruitful collaboration with third parties

This cross-cutting theme focuses on guidelines, policies and regulation that help to deal with any issues or opportunities that arise in (developing) collaborations with third parties, with regard to the outputs delivered by the projects in the Open Science programme. Examples include matters related to Intellectual Property (IP), copyright and licenses.

Key deliverables: guidelines open software transferred into policy document (2020), policy document on fruitful collaboration with third parties (2021), implementation plan for mandatory publication of master theses (2021).

Skills for Open Science

Researchers, teachers, students and support staff will (further) develop certain skills in order to be able to apply the Open Science principles in their daily practices. This cross-cutting theme will create an overview of this skills needed and connect the existing training modules (and training still in development) in the projects, and coordinate the further development of courses in a comprehensive way.

Key deliverables: training overview (2020), course calendar (2020), Open Science personal development path (2021), overview of skills required (2022).

In addition to these projects and cross-cutting themes, an exploration of two topics will be conducted:

Citizen Science

The need to strengthen the relationship between science and society is topical, both at national and European level. Involving citizens in research by giving them an active role is one way to strengthen this relationship, and is something TU Delft researchers already have experience with. In 2020, an exploration will be conducted based on desk research, interviews and workshops. Central questions will be: what is citizen science, how can citizen science contribute to the TU Delft Strategic Framework 2018-2024, what benefits does citizen science have for the Open Science Programme, and what kind of outputs would a citizen science project deliver to the TU Delft organization?

Key deliverable: a proposal whether, and if so how, to incorporate citizen science into the *TU Delft Open Science Programme 2020-2024.*

Open Science Lab

In the first year of the programme, the feasibility of an Open Science Lab will be explored. The Open Science Lab could play a leading role in the development and innovation of (digital) Open Science tools, workflows and infrastructures for scientific analysis and communication. It can be a place for researchers and teachers to work across disciplines and, aided by experts such as data stewards and software engineers, experiment, develop and showcase new ways of doing research and education in the open era. The Open Science Lab can also enable TU Delft to learn from research on Open Science in order to improve its Open Science practices.

Key deliverable: a proposal whether, and if so how, to incorporate the development of an Open Science Lab into the *TU Delft Open Science Programme 2020-2024.*

2c. Flash-forward - TU Delft in 2024

This programme has been designed to manage the organizational changes that are necessary to make Open Science the default way of practicing science at TU Delft. All projects will deliver various types of outputs, which are intended to be implemented in the organization. This transition from programme to operation will be successful if:

(1) the project outputs are indeed perceived as beneficial by the relevant stakeholders, i.e. as “actual improvements”;
(2) the organization is capable of incorporating the project outputs, for instance in terms of processes, infrastructures, or skills required.

Improvements

Benefits, or the “actual improvements”, are at the very heart of the Open Science programme, because they justify its existence. A benefit is a preferably measurable improvement, which contributes to a TU Delft objective. In this programme, *financial improvement, increase of effectiveness and/or efficiency, contribution to corporate objectives, and stakeholder impact* are the key benefits. Examples are:

- *Financial improvement*, e.g. more affordable resources for students (Open Education)
- *Increase in effectiveness and/or efficiency*, e.g. data are easier to find and to access, which opens up potential for new research questions (FAIR Data)

- *Contribution to corporate objective*, e.g. TU Delft core value “transparency” made explicit (Fruitful Collaboration with Third Parties)
- *Stakeholder impact*, e.g. better support in creating and handling code (FAIR Software)

Throughout the programme’s lifespan, the programme team will monitor the realization of the programme’s benefits, and report to the steering committee and the Executive Board on the progress made.

Incorporation

The capabilities necessary to implement the desired organizational change are discussed below. It is a description of the characteristics of TU Delft, after completing the desired transformation, in terms of *processes, organizational structure, technology* and *information*. In 2024, TU Delft has the following characteristics:

Processes (e.g. policy, business models)
- Implemented and updated open access policy
- Implemented policy for handling APC (Article Processing Costs)
- Vision on research data management training
- Implemented policy on creating, handling and archiving code
- MOOCs production process in place
- Implemented policy for handling rewards & recognition in open era
- Implemented policy and business model for fruitful collaboration with third parties

Organizational structure (e.g. roles, skills, organizational culture)
- Training for Open Science skills available
- Open Science skills embedded in career development paths
- Ability to negotiate transformative deals
- Organizational endorsement of new roles (e.g. data manager, research software engineer) as job profiles in academic HR matrix
- Organizational endorsement of differentiation in career paths
- Centralized teacher support
- Copyright & open licenses desk in place

Technology (e.g. infrastructure, IT systems and tools)
- Implemented open access dashboard
- Implemented open publishing platform
- Tools for next generation metrics available in publishing services
- Infrastructure in place for electronic notebooks
- Platform in place for publishing open educational resources
- Repository for open educational resources
- Search engine for open educational resources
- Central registration system for Open Science training in place

Information (i.e. information and data required to manage the operation)
- Updated website Open Science at TU Delft
- Operational training calendar available

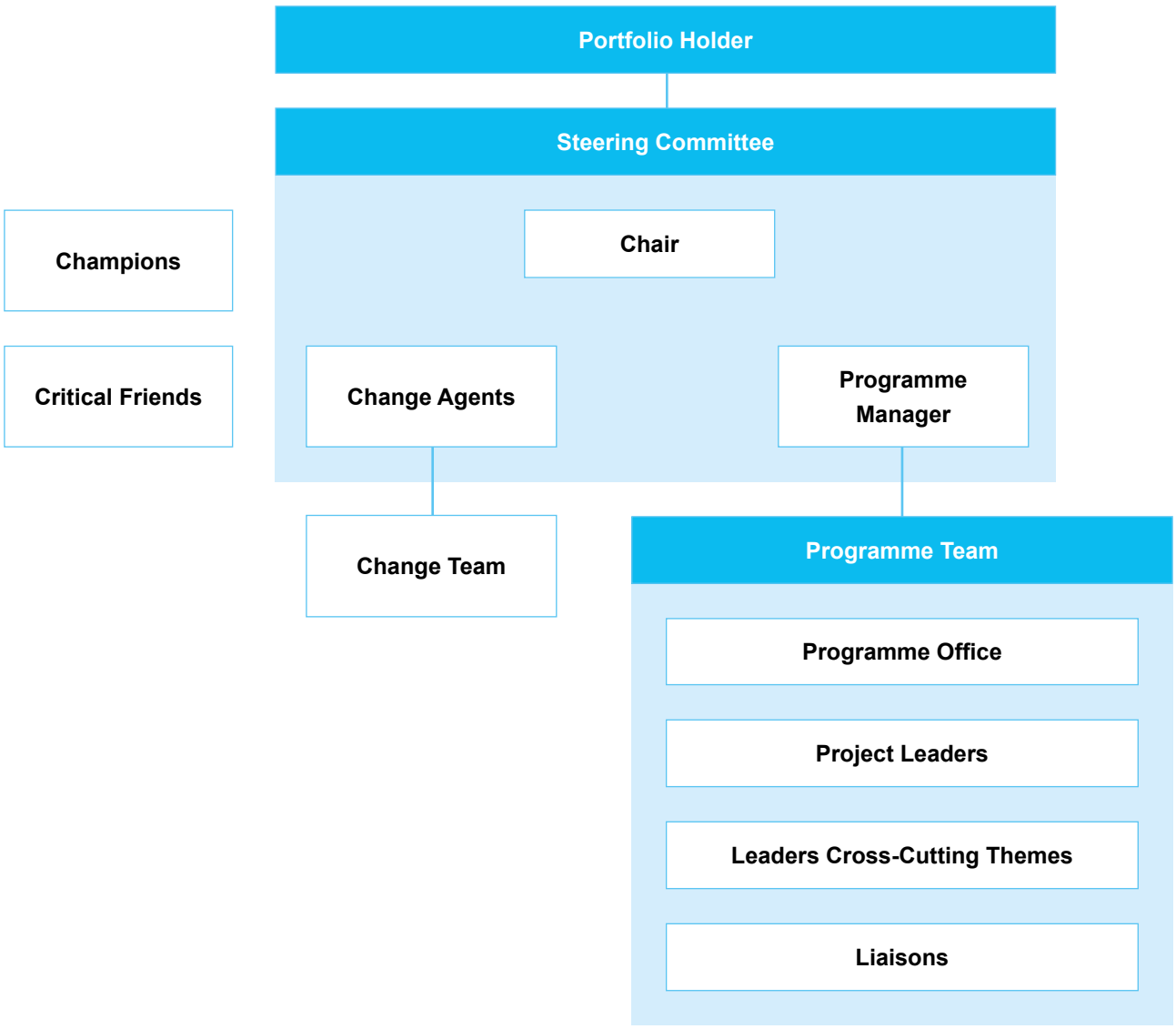
As part of each project, the gap between the current situation and the future situation will be analyzed. Following that analysis, the steps for planning and managing the journey from where the organization is today to the future situation will be identified. Throughout the programme’s lifespan, the project leaders will reach out to key stakeholders in the faculties and university services where outputs are expected to be implemented, and collaborate closely with them.

3

Management of the programme

3a. Roles and responsibilities

Portfolio holder of the *TU Delft Open Science programme* is VRM Rob Mudde. The programme will be coordinated by a steering committee, and will be managed by a programme team. Chair of the steering committee is Wilma van Wezenbeek, director of TU Delft Library. The other steering committee members are Jan Dirk Jansen, Dean of the Faculty of Civil Engineering and Geosciences (representing all faculties); Paul Hillman, director of ICT/FM (representing all university services); and Irene Haslinger, who also chairs the programme team. The roles and responsibilities within the programme are described in more detail below.



Portfolio holder (Rob Mudde)
Is the main driving force behind the programme at Executive Board level.

Steering Committee (Wilma van Wezenbeek, Jan-Dirk Jansen, Paul Hillman, Irene Haslinger, Jennifer Achterhof (secretary))

Chair Steering Committee (Wilma van Wezenbeek)
Is the individual with the overall responsibility for ensuring that the programme meets its objectives and delivers the projected benefits.

Change agents (Paul Hillman and Jan-Dirk Jansen)
Are responsible for ensuring that the implementation and embedding of the new capabilities are delivered by the projects, both in the faculties and in the university services. Members of the steering committee.

Programme manager (Irene Haslinger)
Is responsible for the set-up, management and delivery of the programme. Member of the Steering Committee.

Programme team

Programme office (Anke Versteeg (secretary to the programme), Najiba Abdellaoui, Jennifer Achterhof, Saskia Wijnands)
Form the information hub of the programme, which includes the communication activities to all stakeholders involved.

Project leaders (Just de Leeuwe, Alenka Princic, Alastair Dunning, Meta Keijzer-de Ruijter, Mark Schenk, Nicole Will, Willem van Valkenburg, Sabine Kunst)
Are responsible for managing a project and delivering the outputs.

Leaders cross-cutting themes (Rianne van den Bogerd, Nicole Will, Annekee Vervoort)
Are responsible for managing a cross-cutting theme and delivering the outputs.

Liaisons (Willem van Valkenburg, Mark Schenk, Lotte Melenhorst, Annekee Vervoort, Rianne van den Bogerd, Adriaan van Noord, Najiba Abdellaoui)
Are the linkings pin between the programme and a specific university service. They report to their directors on the programme's progress and signal important Open Science related developments/needs back to the programme.

Other roles within the programme

Change team (names to be collected in 2020)
Is a group of specialists located within the faculties and university services, appointed to support the change agents in implementing the programme's outputs. They report to the change managers who sit on the steering committee, and to the programme manager.

Champions (names to be collected in 2020)
Are the linking pins between the programme and scientific staff in the faculties. Important category of stakeholders as they articulate the demands and wishes of our stakeholders. Champions are usually early adoptors of Open Science practices.

Critical friends (names to be collected in 2020)
Are trusted persons that ask provocative questions, provide data to be examined through another lens, and offer constructive criticism of the programme's developments as a friend.

3b. Business case

The business case is used to validate the initiation of the programme, and the ongoing viability of the programme. The business case will be assessed on a regular basis, at least after completion of a work plan and while preparing next year's work plan.

Options analysis

For the implementation of the *TU Delft Open Science Programme 2020-2024*, the Executive Board will approve annual work plans. Starting with the work plan 2020, the level of ambition for each project and cross-cutting theme will be specified. By reassessing the ambitions and progress on an annual basis, the Executive Board has the opportunity to adjust the focus on projects and cross-cutting themes during the lifespan of the programme. In this way, both internal and external developments can be taken into account, and the realization of the programme's ambitions can be optimized.

Stakeholder engagement

The programme makes use of a stakeholder analysis that provides input for a systematic (communications) approach to all players involved. Specific communications activities for individual projects will be part of the project plans.

Indicative budget and time scale

The indicative budget contains project costs and programme management costs. Project costs are costs made in delivering the enabling outputs. Programme management costs are costs for managing the programme, and may include entries like programme roles, communication activities, or a contingency budget for dealing with risk and change. Costs that are typically associated with realizing the change in the existing organization (staff or infrastructure in the faculties and university services) will not be part of the budget and will remain implicit. If Citizen Science and an Open Science Lab are incorporated in the programme after 2020, project costs will increase correspondingly from 2021 onwards.

	2020	2021	2022	2023	Total in K euro
Project costs	550	700	700	700	**2650**
Programme costs	50	100	100	100	**350**
Total in K euro	**600**	**800**	**800**	**800**	**3000**

The programme has a life span of 4 years (2020-2024). For each year, a detailed work plan will be presented to the Executive Board, including a budget for the year concerned and an overall estimate for the remaining years of the programme.

Risk assessment

The major risks to the programme are described below. A description of the risks at project level are included in the full project dossier (see Appendix A).

1. Capacity problems in terms of staff (time available and expertise needed).
   All project leads and all leaders of the cross-cutting themes have a role in the established organization as well. They do not have enough time to deliver within the programme, which leads to lack of progress or poor quality of the deliverables.

Mitigation: Should this kind of problem arise, the programme manager will discuss the capacity problem with the dean/director of the faculty/university service that it concerns. If there is no improvement, the programme manager will escalate to the steering committee. Ensuring participation from a faculty or university service in terms of a clearly defined role or an established amount of fte will also mitigate the risk.

2. Priority problems.
   This relates directly to the capacity problem. Participating in a project/programme, in addition to a regular job with all its day-to-day hassle, may lead to a situation in which project activities are consequently accorded low priority.

Mitigation: Should this kind of problem arise, the programme manager will address the issue with the project lead involved. If there is no improvement, the programme manager will escalate to the steering committee. Ensuring participation from a faculty or university service in terms of a clearly defined role or an established amount of fte will also mitigate the risk.

3. Dependence on individuals
   The programme relies heavily on a small group of key players. Should they leave the TU Delft, this may lead of lack of support and stagnation of the programme.

Mitigation: Expand the number of key players by effective stakeholder engagement.

4. Scope difficulties.
   Scope creep leading to inertia because the programme directly relates to comprehensive topics like alternative rewards & recognition in academia.

Mitigation: Firm and consistent programme and project management.

Progress and evaluation

The steering committee will report to the Executive Board at least once a year, when a work plan has been completed and next year's work plan will be presented. A work plan includes:

- An evaluation of the previous year (progress made by projects and cross-cutting themes)
- An options analysis for the coming year
- An assessment of the business case, including budget and time schedule
- An assessment of the progress made in realizing the organizational capacities needed in 2024
- An assessment of the validity of expected benefits
- An assessment of the risks (at programme and project level)
- An assessment of the issues that arose and handling thereof, for future development and learning

In addition, there will be regular informal progress meetings with the Executive Board's portfolio holder for Open Science, the chair of the steering committee, the programme manager and the liaison for strategic development. The steering committee assembles at least four times a year. The leaders of the projects and cross-cutting themes meet weekly at an informal check-in meeting, and have regular progress meetings with the programme manager and the secretary to the programme. Regular progress meetings take place between the chair of the steering committee and the programme manager.

Appendix A
Full project dossier

PROJECTS

Open Education: Increasing Open Educational Resources

Willem van Valkenburg & Nicole Will

I. Brief description of the project

The project supports teachers in adopting and adapting teaching and learning methods through open education. It also helps to keep education accessible and affordable for students. The project builds on current practices such as Open Courseware and MOOCs. Support includes training, advice, tools and infrastructures, for instance for sharing and reusing teaching materials.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Open Textbooks	Standard production service for Open Textbook publishing compliant to 5Rs	Open Publishing Platform	2020	High
Interactive Open Textbooks	Support for creating and publishing interactive open textbooks	Open Publishing Platform	2020	Medium
Replacing commercial textbooks with open resources	Inventory of current situation		2021	High
	Teacher support for replacing commercial textbooks			
Open assessment & exercise platform	Mathematics and digital skills assessments and exercises published online with an open license	Skills for Open Science	2020	Medium
Copyright & Open Licenses helpdesk	Functional copyright & open licenses helpdesk including improved website		2020	High
	Integrated Copyright & Open Licensing services in Teaching Academy Services			
	Teacher support, including training			
Content curation	Develop training in finding, selecting and (re)using OER	Skills for Open Science	2020	Medium
	Core users training per faculty (faculty coordinators for Open and Online Education)			
Collaborative content creation	A digital platform to collaboratively create content		2020	Low
OER Search Engine	Improved and automated OER content curation		2020	Medium
Minor based on open courses	Pilot and evaluation for minor based on open courses from other universities		2020	Low
	Open Minor Policy			
Teacher training (UTQ) programme	The UTQ teacher training programme applies open education practices	Skills for Open Science	2020	Medium

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
No extra capacity (especially open education project manager)	5	1	5	We have to downgrade our ambitions and prioritise projects.
Changing priorities within education	3	3	9	Continue to raise awareness and show success to faculty management, ESA MT and Executive Board
Can't deliver (over promise to teachers)	4	2	8	Be aware what we promise and scale up in capacity if necessary Inform teachers of new tasks involved
Don't get external funding	1	3	3	Only applies to low impact projects

Impact (I) and possibility (P) are indicated on a scale from 1-5. The overall risk (I*P) is calculated by multiplying the impact and possibility number.

Open Access: Going Forward with Open Access

Just de Leeuwe

I. Brief description of the project

In the coming years, the focus of Open Access will be extended from peer-reviewed scientific articles to books, conference proceedings, book chapters, reports, reviews and educational resources. The project supports this development by addressing both policy and infrastructure aspects that are crucial to the further development of Open Access practices.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Open Access Policy TU Delft	Revision Open access policy compliant with Plan S and Horizon Europe		2020	High
	Growth ambition of Open Access determined; to monitor targets for TU Delft open access publications 2020-2024		2020	High
Dashboard Open Access	Real-time Open Access visualization tool for TU Delft researchers based on CRIS data		2021	Medium
Plan S Implementation	Plan S requirements are processed in the information infrastructure; webpage adjusted and custom made consultancy kit for researchers	Rewards & Recognition in the Open Era	2020	High
Project Taverne, You share, we take care! implementation	Embedding of Taverne legislation at TU Delft as a result of policy decisions been made at VSNU level		2020	Medium
Transformative publishers agreements	10 successful negotiations on transformative deals deliverables in 2020-2022		2020	High

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Policy paper for handling APC-cost for all TU Delft researchers	Policy paper on the establishment of a central handling unit for all (open access) publication costs at TU Delft in order to act as cost-effectively as possible		2021	Medium
Infographic(s) Open Access	Professional Infographics informing researchers about Open Access participation		2020	Medium

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
The smaller and medium sized publishers and societies are not yet ready to conclude transformative deals	4	2	8	the use of green open access, such as Taverne, will have to be used optimally
Making TU Delft Open Access policy successful and finding right incentives	3	3	9	set up flexible workflows to acquire open access content so that researchers are burdened as little as possible
Being able to use the necessary financial resources to pay for the more expensive transitional period of open access and to achieve the set goals	4	2	8	Work cost-consciously through more effective workflows and payments from APCs within TU Delft accompanied by robust negotiations with publishers

Open Publishing Platform: Open Publishing on a TU Delft Platform

Alenka Princič

I. Brief description of the project

Open Publishing is a form of scholarly communication that offers not only free access to scientific publications, research data and educational materials, but also provides the infrastructure and processes for creating open content. Open publishing infrastructures use open source software wherever possible, thus reducing the intrinsic costs of the publishing process. The project will deliver a publishing platform, together with services that will enable TU Delft researchers to adopt the open publishing principle.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Platform	Publishing platform TU Delft OPEN for three initial mainstream products (roll-out website), + events, marketing, communication		2020	High
	Additional publishing streams: registered reports, dissertations, 'negative results', etc.	Open Education	2021	High
	A platform enabling single article publishing.		2021	High
	A platform for layman's language publishing - highlights of the research at TU Delft.		2022	High
Platform innovation development	A process enabling innovative forms of open (peer) review, and open post-publication commentary	Rewards and Recognition in the Open Era	2020	High
	A process enabling registering reviewers' work in order to assign the credits for their work (e.g. model of Publons)	Rewards and Recognition in the Open Era	2020	High
	'Enhanced/interactive' publication format.	Open Education	2020	High
Workshops	Workshops on aspects of open publishing	Skills for Open Science	2020	Medium
Guide	Stepwise guide to open publishing at TU Delft	Skills for Open Science	2020	Medium
Advice	Publication- and dissemination strategy advice based on research analytics of the open access zone & online visibility checklist		2021	Medium
Support	Editorial support for the material of TU Delft OPEN platform in year 1, incl. embedded copyright check, similarity (plagiarism) check, and 'predatory journals' check, etc.		2020	Medium
	Support in writing of high standard English language manuscripts		2020	Low
Tool	Next generation-, social media metrics and article level metrics	Rewards and Recognition in the Open Era	2020	High

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
Researchers, i.e. authors or editors not engaging. Difficult to keep the continuity of publishing flow to secure credibility and authority as a part of institution's brand.	5	2	10	Create an engagement and communication plan, and a marketing plan to disseminate service and content. Form early-adopters community to create Reputation. In case of being too successful, if the growth is bigger than excepted, adapt our business plan and address extra resources.
Unable to secure high quality due to lack of organizational embedding: capacity, costs, means, etc.	3	3	9	Create a business plan and get approval for organizational embedding and follow-up steps.
Difficulty to innovate due to time, knowledge, capacity, etc.	4	3	12	Include innovation projects in a Business plan, reserve a % to dedicated innovation activities, make innovation part of the workflow.
External risks – shifts in international policies/initiatives in open science and open access (e.g. Plan S)	5	1	5	

FAIR Data: making research data FAIR

Alastair Dunning

I. Brief description of the project

The project creates a stronger bridge between the current policy, infrastructure and culture of data stewardship and scientific practice, for instance by exploring new roles like data manager, in order to fulfill the researchers' actual needs in managing their research data. A coherent approach to FAIR data, which also takes into account the limits to open data, helps make research more transparent and efficient.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Research Data Training	A completed vision for Research Data Management training	Skills for Open Science	2020	Medium
	The basis for a suite of sustainable high-quality courses on Research Data			
Geospatial Data Pilot	A study to assess how best TU Delft can share and publish geospatial data		2020	Low
	Evidence needed to start building such a platform			
Images of Research Pilot	A study to assess the need for a platform for publishing images		2021	Low
	Evidence needed to start building such a platform			
Limits of Open Data	A study to define the technical, ethical and commercial limits of Open Data	Fruitful Collaboration with Third Parties	2020	Low
	Evidence to update relevant policies practices and infrastructure			
Data Managers	Data Manager Pilot completed, with Data Managers having been embedded within groups / sections of different TU Delft faculties	Rewards and Recognition in the Open Era	2020	High
	A strategic plan for sustaining Data Managers within TU Delft			
FAIR Disciplinary Guidelines	Established network of international colleagues in specific subjects		2020	Medium
	Progress in developing FAIR Disciplinary Guidelines in specific subject			
Data Hubs	Building Data Hubs for specific disciplines		2021	High
	Collections of FAIR (meta)data in specific disciplines			
Re-Use in Education	Published Datasets available for re-use in Education	Open Education	2021	Medium
	Embed use of datasets in education			
New data formats for Open Science	Exploring new data formats for Open Science - 4 completed case studies on four new data formats		2021	Medium
	Recommendations for tools, skills and infrastructure needed to embed such formats in open science			

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
Data Managers can't find right project	4	2	8	Advertise Data Manager project - use Data Stewards to identify best fit
Finding enough data for data hubs	3	3	9	Find right manger with right subject-based network to identify dataset holders
FAIR Disciplinary Guidance - Researchers Not Engaging	3	3	9	Take time to identify right communities and networks

FAIR Software: making research software FAIR

Meta Keijzer-de Ruijter & Mark Schenk

I. Brief description of the project

Research software is fundamental to contemporary research, particularly in the context of reproducibility. If Open Science is to contribute to better and more transparent research, then research software needs to be treated with the same diligence and accuracy as research publications and research data. The project will contribute to this goal by developing and facilitating various aspect of research software, including policy, infrastructure and organizational culture.

II. Table project outputs 2020-2024

Deliverable	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
(Open) software policy	Existing guidelines transferred into policy incl. licenses for open software	Rewards and Recognition in the Open Era	2020	Medium
	Guidelines for creating, handling and archiving code and software		2020	Low
Skill development for researchers	Definition of required skills for researchers and PhD's (basic and advanced)		2020	Low
	Curriculum for software development skills implemented	Skills for Open Science	2020	Medium
Support software development	Pilot coding assistant support for individuals and groups		2020	Medium
	Set up a RSE community		2020	Medium
Research Software Engineers	Pilot for RSE	Rewards and Recognition in the Open Era	2020	High
	A strategic plan for sustaining RSE's within TU Delft		2022	High
Deployment, configuration and evaluation of TU GitLab	Roadmap for TU-Gitlab deployment		2020	Low
	Pilot additional functions TU GitLab		2020	Medium

Deliverable	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Deployment, configuration and evaluation of TU Jupyter Notebook Hub for research	Pilot with Vocareum by EWI: curriculum adjusted to research needs		2020	Low
	Scope and roadmap for TU-JNH for research defined		2021	low
E-lab notebooks	Evaluate current E-lab notebooks pilot		2020	Low
	Create strategy and roadmap for ELN		2021	Low

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
The needs from research groups (or individuals) is too diverse to organize from a central location.	4	1	4	Investigate whether a common ground can be created
Cannot find skilled RSE's	5	4	15	Involve recruiter and define the right incentives
Priority and capacity of knowledgeable core staff	4	5	20	Consensus on priority

CROSS-CUTTING THEMES

Rewards & Recognition in the Open Era

Annekee Vervoort

I. Brief description of the cross-cutting theme

To encourage the actual practice of open science principles, it is imperative that researchers and teachers are rewarded and recognized for their efforts. This cross-cutting theme will support the development of tools and initiatives that acknowledge activities and behaviour that contribute to all dimensions of open science practices, which will lead also a significant cultural change.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Exploration	Overview of incentives and changes in rewards & recognition systems		2020	High
	Baseline assessment of TU Delft climate w.r.t. rewards and recognition for Open Science		2020	High
Implementation plan	Incorporate Open Science in criteria for hiring and promotion, including recognition of engagement with Open Science in the R&D cycle	All projects, Skills	2020	Medium
	TU Delft policy for differentiation in career paths	All projects, skills	2020	Medium
	Development of TU Delft alternative methods for research assessment	All projects	2020	Medium

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
No additional capacity for project support	5	1	5	Adjust priorities, deliverables and/or timeline
Lack of engagement and input from scientific staff to define and accept alt metrics	5	3	15	Involve deans and scientific staff in the definition of alt metrics from the start, identify and use champions or adapt plan outcomes
Dependency on other project themes with regards to the development of tools, training and ownership	3	3	9	Adjust priorities or timeline
Need for change is not shared by scientific staff.	4	5	20	Involve deans and scientific staff in the making of policies from the start, identify and use champions, inform staff of existing international open science incentives and initiatives or adapt plan outcomes

Fruitful collaboration with third parties

Rianne van den Bogerd

I. Brief description of the cross-cutting theme

This cross-cutting theme focuses on guidelines, policies and regulation that help to deal with any issues or opportunities that arise in (developing) collaborations with third parties, with regard to the outputs delivered by the projects in the Open Science programme. Examples include Intellectual Property (IP), copyright and licenses.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Fruitful collaboration with third parties policy	A policy document on Fruitful collaboration with third parties		2020	Medium
Implementation plan for mandatory publication of Master thesis	Implementation scheme for the 4TU decision to make all Master theses publicly available		2020	High
(Open) software policy	Guidelines transferred into policy about licenses for open software	FAIR Software	2020	Medium
Data Problems Analysis	Definition of legal and practical issues and gaps regarding data as a legal topic	FAIR data	2021	Low

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
Different interests, so many internal parties involved	3	3	9	Inform and collect input from all stakeholders
Overlap with other programmes: vision on integrity and open innovation program	3	2	6	Frequent contact and discussions with other programme leaders
‘awareness’ is also an important subject There is a risk that a project will not be sufficiently supported by scientific staff	5	4	20	Involve the researchers, deans, contract managers during the process and the making of policies

Skills for Open Science

Nicole Will

I. Brief description of the cross-cutting theme

Researchers, teachers, students and support staff will (further) develop certain skills in order to be able to apply the open science principles in their daily practices. This cross-cutting theme will create an overview of this skills needed and connect the existing training modules (and training still in development) in the projects, and coordinate the further development of courses in a comprehensive way. A difference should be made between trainings (courses) where participants learn and acquire skills and knowledge and activities like roadshows and presentations aimed for creating awareness on certain topics. This project only takes into account the trainings.

II. Table project outputs 2020-2024

Deliverables	Subdeliverables	Dependencies with other projects/themes	Starting year	Priority
Training Overview	Inventory of trainings from projects and cross-cutting themes	All projects and themes	2020	High
	Standardized course description classified by audience, levels, topics			
Calendar	Coordinated training calendar		2020	High
Course integration	Training integrated in existing programmes		2020	Medium
Course registration	Central course application and registrations system		2020	Low
Skills overview	Study that defines skills required	All projects	2020	Low
	Identify gaps in proposed skills trainings			
	Open Science skills framework			
Open Science personal development path	Guidelines about skills levels depending on career stage	All projects and Rewards & Recognition in the Open Era	2020	Medium
	Tool to determine adequate personal learning path and measurable progress			

III. Table project risks

Risk	Impact	Possibility	I*P	Mitigation
Overload of trainings, the audience is overwhelmed with information and therefore trainings are not chosen.	4	3	12	Define clear course outcomes and levels, expectation management, collaboration between projects and course programmes
Possible overlap and competition between the projects	3	3	9	Define clear course outcomes and levels, coordination between projects mandatory
Limited number of participants due to course format (face to face vs online). Limited recurrence of trainings because of limited teachers/trainers availability/capacity	3	3	9	Train teachers, train the trainer like “open researchers” and “open teachers” who will transfer (teach) their knowledge to colleagues.
Lack of pedagogical skills within the projects to guarantee qualitative trainings.	2	3	6	Collaborate with learning developers to professionalize trainers/teachers
Confusion between training (real course) and awareness sessions	2	4	8	Clear and honest communication.

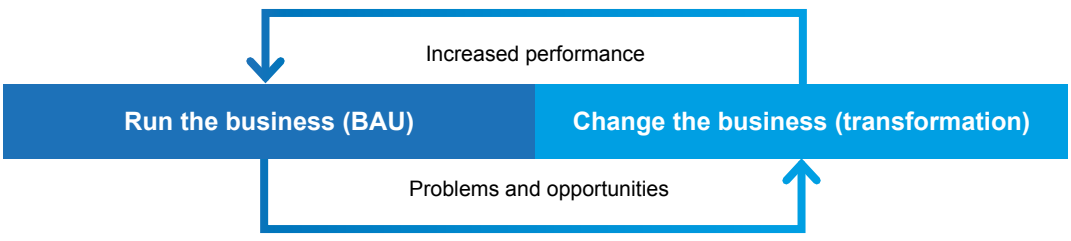
Appendix B Introduction to Managing Successful Programmes (MSP)

1. Run the business, change the business

The TU Delft Strategic Plan Open Science 2020-2024 is inspired by the MSP approach for managing projects and programmes. This approach starts from the idea that each organization is subject to continuous change. There are many drivers for change, including innovations in technology, working practices, increased demands from regulations or policies, changes in the political landscape, mergers etc. MSP offers a framework for aligning two critical organizational elements:

1. Delivering successful mechanisms for change
2. Maintaining performance and effectiveness in a business-as-usual environment

It manages the natural tension that exist between these elements by making the benefits of a change explicit to an organization and its stakeholders. It also manages the transition of solutions delivered by projects into the organization's operations.



Run the business, change the business

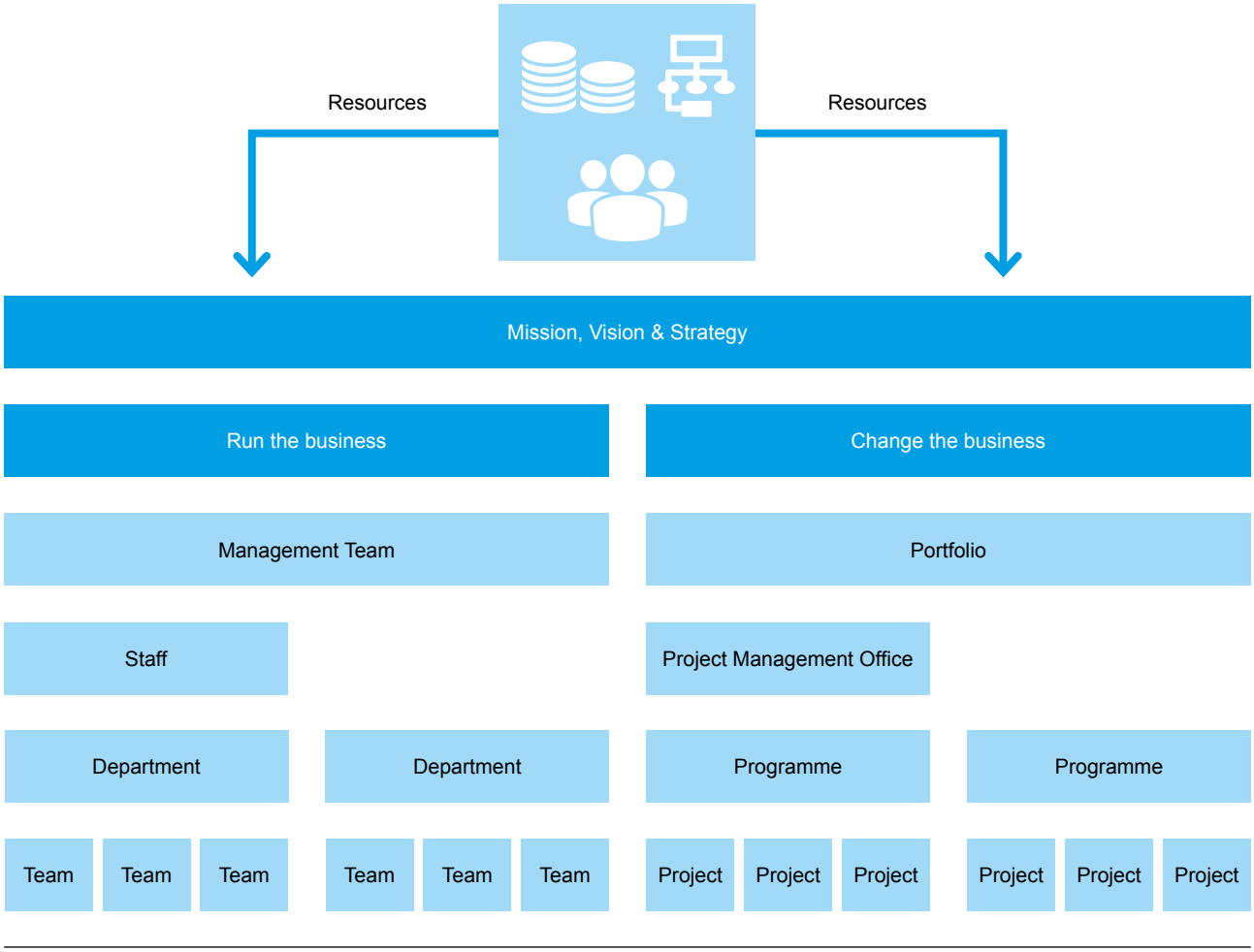
Mechanisms for change take the organizational shape of projects, programmes and portfolios. In the Open Science programme, the following definitions are used:

Project
A temporary organization that is created for the purpose of delivering one or more outputs according to a specified business case.

Programme
A temporary flexible organization structure that is created to coordinate, direct and oversee the implementation of a set of related projects in order to deliver benefits related to an organization's strategic objectives.

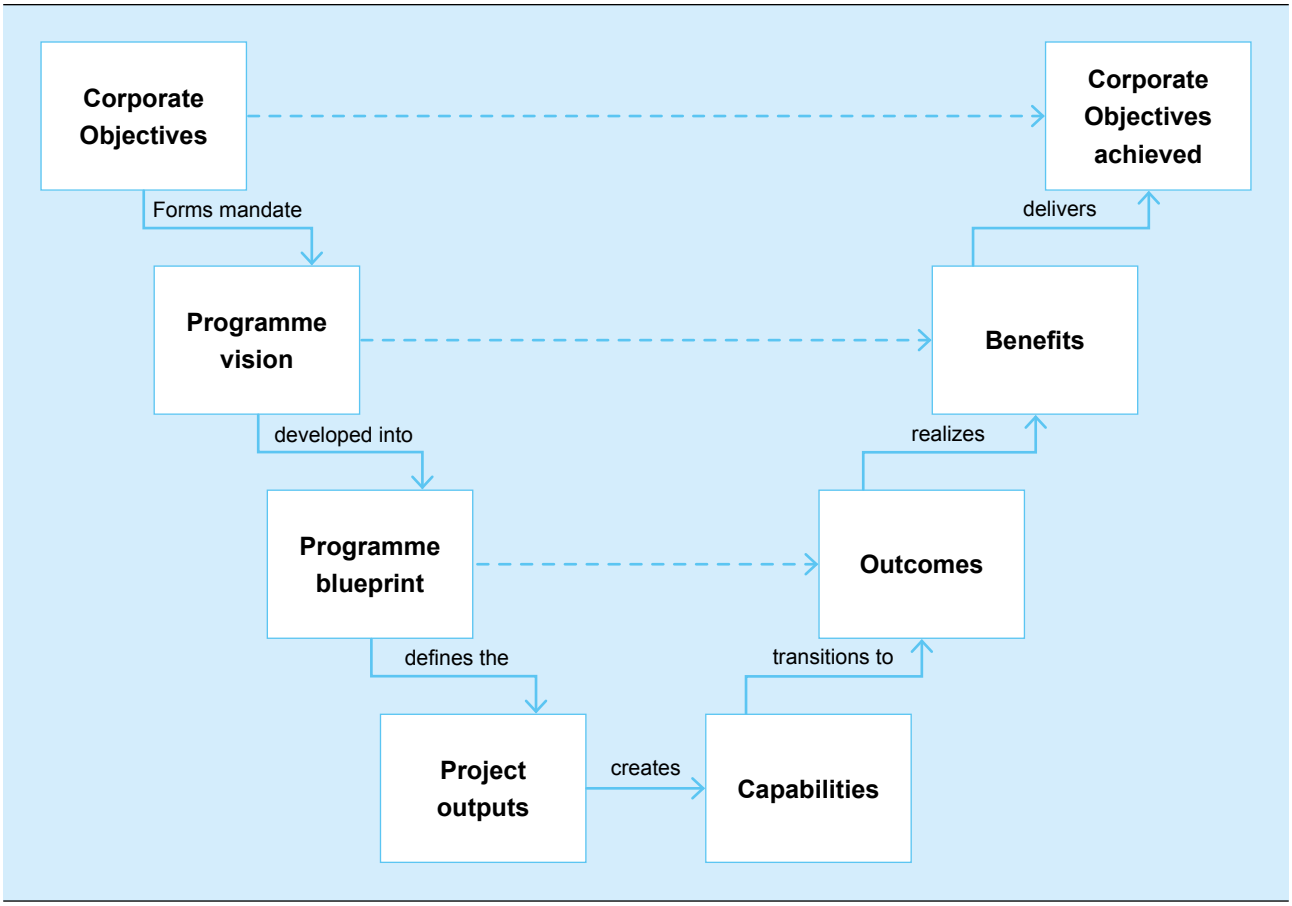
Portfolio
The totality of an organization's investment in the changes required to achieve its strategic objectives.

This is illustrated in the picture below:



2. The story behind a programme

Programmes normally serve to deliver corporate objectives. The logic behind a programme can be visualized as follows:



Corporate objectives	The corporate objectives drive the development of the programme vision, in this case the TUD strategic Framework 2018-2024.
Programme vision	The vision is a picture of a better future (see section 2a, vision and ambition)
Programme blueprint	The vision is expanded into a blueprint for the future organization. The blueprint describes the characteristics of the future organization, after completing the desired transformation (see section 2c, Flash-forward - TU Delft in 2024).
Project outputs	The blueprint defines what the projects need to create. These are formulated as project outputs (see section 2b, projects and cross-cutting themes, and Appendix A).
Capabilities	The projects deliver outputs which create capabilities. Capabilities are services, functions or operations that enable the organization to implement a change. They exist prior to the transition (see section 2c, Flash-forward - TU Delft in 2024).
Outcomes	Capabilities are transitioned into outcomes: the results of the change, the new operational situation. Outcomes enable the realization of the benefits (see section 2c, Flash-forward - TU Delft in 2024).
Benefits	Benefits are achieved and contribute to the corporate objectives (see section 2c, Flash-forward - TU Delft in 2024).

3. MSP and the TU Delft Strategic Plan Open Science 2020-2024

MSP is used as a framework for defining and managing the *TU Delft Open Science Programme 2020-2024*, and a number of MSP documents have been created as background texts on the basis of which the strategic plan has been written. They will be used by the programme team as a backbone for monitoring progress and benefits realization.

Information baseline	Description of purpose
Boundary	Those which set out the direction and the scope of the programme. • Vision and ambition (section 2a) • Blueprint (section 2c) • Benefits profile (section 2c) • Business case (section 3b) • Project dossier (section 2b and appendix)
Governance	Those that set the standards and frameworks within which the programme will be delivered. Defines *how* the programme will be managed. • Organization structure (section 3a) • Stakeholder engagement strategy (section 3b) • Risk management strategy (section 3b)
Management	Those that are created and used to manage the delivery of the programme. Defines *what* activities will be undertaken by *whom* to deliver the programme. • Work plan (per year) • Communications plan • Issue register

Colophon

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