



Information enabling Education & Research

'Engaging in the real conversation'

the 2018-2021 I-strategy
of Maastricht University



Key messages of the I-strategy 2018 - 2021

Key in our three years strategy is **to build the foundations** to be ready for future developments **in Education & Research**. It is our first step in the I-domain from running to differentiating the university.


In this transition we have three main objectives. First is to create **real added value** for the UM using IT **in both education and research**. Secondly we want to be **more efficient**. Therefore we want to spend more on innovation in stead of 'keeping the lights on' (7:93). Our new capacity ratio should be at least **30:70**. And our last objective is to **protect our data and assets** and **comply with security and privacy related regulations**.

Therefore we need to improve in all three area's of People, Process and Technology. To build the foundations we will, among others, **increase the I-literacy** within the UM, setting the base for **Research Data Management**, develop an **Open Workspace**, **uniform our non differentiating processes**, and support this with **IT4IT**.



You are about to read the new I-strategy. This short instruction tells you how this document can be read so that you can get the most out of it.

Besides reading the document chronologically it is also possible to hop through the document to specific items. By clicking on the UM logo on the top left of a page you'll be directed to the overview page of the document. From here you can easily go directly to one of the main topics.

The  icon indicates that more detailed information is available. It can be accessed by clicking the icon. By clicking on the back arrow you'll go back to the main document.

Enjoy reading!

Disclaimer

This document and the statements in it don't have any formal status yet. All slides of this document have been compiled with great care. Nevertheless, in this stage, there still might be inconsistencies or misunderstandings in this document. This document is composed based upon workshop sessions, input per domain, a survey and desk research of both internal and external documents.



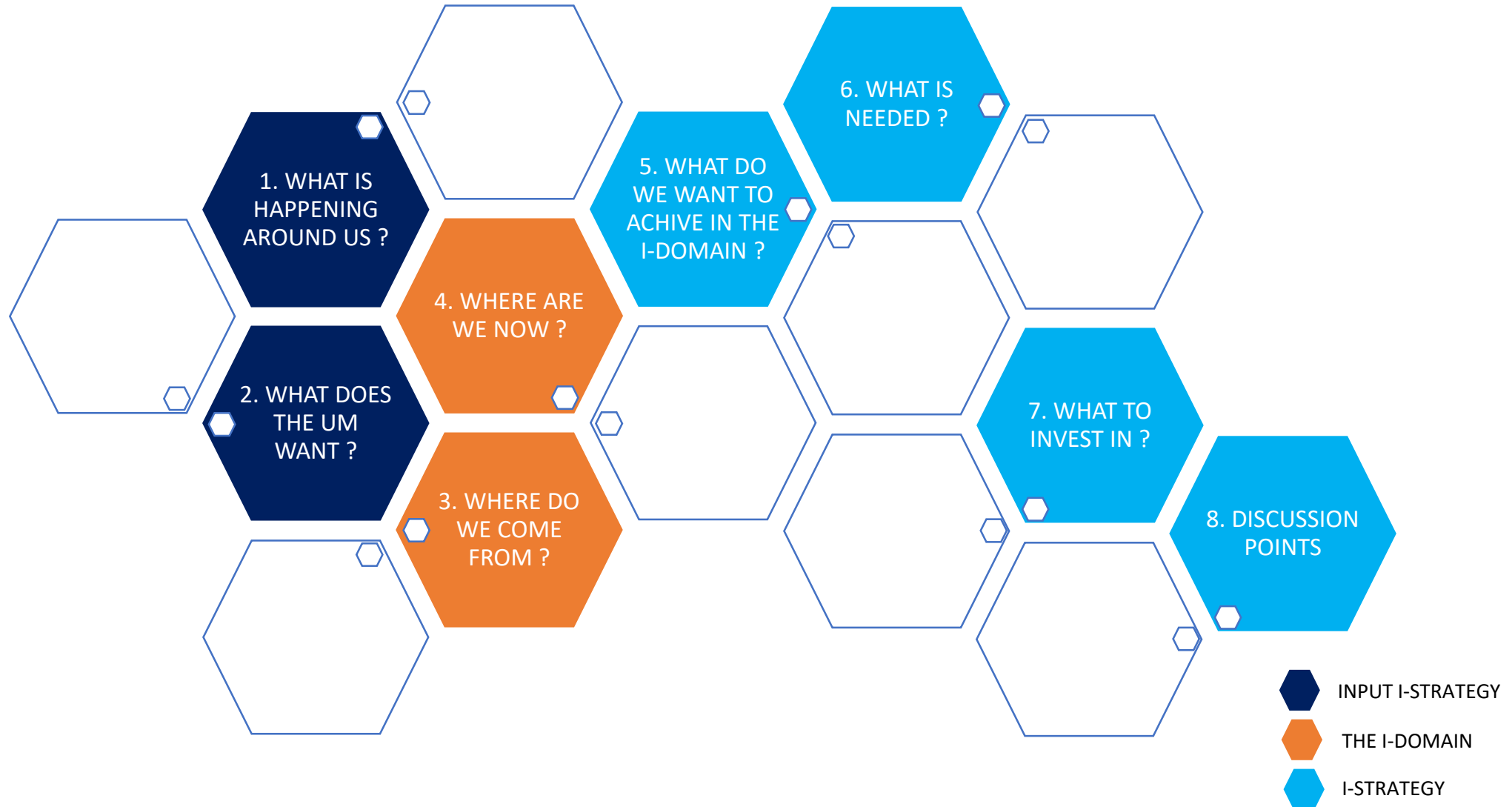
“ We are living in an information age. Because of digitization information is everywhere. Also within the UM. We use information to support our students in their learning process, we produce information in our research, we analyse our information to operate the UM organisation.

Information is more than technology. Digitisation, though, can help us in many ways. In becoming FAIR, in supporting blended learning, in simplifying our operations. And sometimes we don't want to digitise. The use of technology can have negative impact as well: on behaviour of individuals or neglecting the PBL principles by using Moocs only. For the UM it is important we have a real conversation with each other. Digital and non digital.

This first version of the I-strategy is a discussion paper, meant as a catalyst to engage in the real conversation with the UM community. The real conversation that will help in getting information enabling education and research. ”



Michiel Borgers



1. WHAT IS HAPPENING AROUND US ?

An overview of important external developments and trends that will impact Maastricht University and the I-domain in particular.

2. WHAT DOES THE UM WANT ?

The UM is directed by its mission, core values, strategic objectives and the main strategies to realize their needs and wants.



1. What is happening around us ?

POLITICAL

The Dutch government has extra funds available for higher education institutions that have specific goals to improve the quality of their education (**Quality Agreements**). To bring more focus in the scientific output of the Netherlands a **Dutch Science agenda** (incl. funding) has been created stating the most important research questions the Dutch government wants it's H.E. institutions to contribute to. The **VSNU acceleration agenda** stimulates H.E. institutions on innovation in education with the help of technology.

TECHNOLOGY

Technological developments come at an ever **increasing pace** and the amount of **data** that is created increases very fast. The usage of **AI/ML** techniques is necessary to be able to make sense out of all this data. Also more and more software vendors are making the transition to a **cloud** delivery proposition to stay competitive. **Model Driven Development** techniques are being used to deliver new apps much faster to be able to keep up with the pace.

ECONOMICAL

We live in a Volatile, Uncertain, Complex and Ambiguous (VUCA) World. The only constant is change. This has major implications for the work people do now and in the future. Knowledge will be outdated soon. Therefore more emphasis must be placed on developing certain **competencies**. For people to stay employable their whole lives they need an open and flexible mindset, good personal competencies and engage in **Life Long Learning**.

LEGAL

The huge increase of personal data that is being gathered, analysed and commercialized as well as the increase in **cybercrime** has given rise to new strict European legislation that wants to protect the privacy of it's people. All companies, organizations and governments need to comply with this **GDPR** legislation. This will have a major impact on what data one is allowed to gather and use and how this should be done.

SOCIAL

The **expectations** of younger generations regarding digital services are high because they are based on the high user experience (UX) of the digital services they're used to in their personal lives (**consumerization of IT**). Students ask for more flexible education to be able to combine study, work and living better. Especially in light of Life Long Learning. Society also demands free **Open Access** to scientific output

ENVIRONMENTAL

More and more people are getting convinced that the **climate change** is a real and serious threat to our planet and it's bio-diversity and therefore the quality of life of all living creatures. This climate change is a direct consequence of human behaviour. Both our **diet** and the **profit maximization paradigm** that underlies all our actions in our current economic system need to change. H.E. plays an important role in advocating **the scientific world view** as an alternative to the current paradigm.



Source: Manifest new I-domain refocus-IT program

2. What does the UM want ?

To be an **INNOVATOR**

To be an innovator in education and research by introducing the CORE philosophy at our university.

To take our **SOCIAL RESPONSIBILITY**

To take our social responsibility seriously by linking the university to society, from the local to the global level.

To adopt an **INCLUSIVE** approach

To adopt an inclusive approach and to open doors to all students and staff who fit with our profile and subscribe to our values.

To be **SUSTAINABLE**

To be sustainable institution in the broadest sense.

“UM wants to be an innovative, inclusive, social responsible and sustainable University which provides Collaborative Open Reserach Education.” source: CORE strategy



CORE

Education and research go hand in hand and must be integrated within the Maastricht University.

Collaborative:

- Education and research are best organized in teams rather than individually;
- The notion of diversity and multidisciplinary approaches;
- Forging links with different stakeholders in the city, the Euregion, the broad European continent and the rest of the world.

Open:

- Being open minded and innovative;
- Being international and inclusive;
- Transparency towards the outside world ;
- The broad dissemination of research ;
- Transdisciplinary in its combination of education, research and societal engagement.

Research Education:

- Integrating research and education

source: CORE strategic programme 2017 - 2021



MUSE

The overall objective of **Maastricht University Student Experience** is enabling students to have a meaningful experience in Maastricht, which helps them shape academically, personally and professionally. There are five overarching themes: **Student Employability, Well Being, ICT and Education, CORE / Global Citizenship Education, and Badge system.**

source: MUSE proposal

This is a summary of all our strategic directives from different sources, of which implications of some directives are still in research.

2. What does the UM want ? Educations view

MISSION / LONG TERM GOALS

The integrated academic and professional development of the student leading up to graduates that comply with the UM graduate profile.



DERIVED GOALS CURRENT STRATEGIC PERIOD

A (1) **PBL learning environment** based on the CORE principles that improves the students learning experience and promote their wellbeing. Enhance (2) **education portfolio** with interdisciplinary programs with local, regional and international partners. (3) Investigate the desirability of offering **personalized learning paths**. (4) Improve quality along the lines of the **focus area's of the quality agreement** with the Dutch government. Deliver a (5) **Life Long Learning** proposition. Maintain current relative Dutch (6) **market share**.

STRATEGY

To be an inclusive, Life Long Learning higher education institution based on Competency Based Learning that revolves around a combination of Problem, Research & Societal Based Learning leading up to graduates that comply with the UM graduate profile.



IMPLIED BUSINESS CHOICES

Student driven personal learning paths, cross faculty collaboration, the embedding of research and societal engagement in the learning curriculum (core), a decrease of the workload for teachers all ask for standardization and alignment of non differentiating education processes.



This is a summary of all our strategic directives from different sources, of which implications of some directives are still in research.

2. What does the UM want ? Research view

MISSION / LONG TERM GOALS

Contribute to solving major global societal and sustainability issues within the framework of our primary research themes and generate economic, financial and social value to society.

DERIVED GOALS CURRENT STRATEGIC PERIOD

Making new (cross discipline) (1) **scientific discoveries** through the use of AI/ML. To have all UM research adhere to the (2) **FAIR data objectives¹ by 2025**. To (3) **increase the grant application success rate and maintain its current PhD output**. To become a (4) **player of size internationally** in the fields of Quality of Life, Europe and the Globalising World, and Learning and Innovation.

¹ concrete, measurable goals will be defined by the CDDI community

STRATEGY

The UM will embrace the Open Science philosophy. The interdisciplinary sharing of research data is enhanced by making sure UM research data is FAIR and AI/ML techniques are used for creating new scientific insights based on this data. The UM publishes under Open Access to optimally disseminate research output and data.



IMPLIED BUSINESS CHOICES

Education of data awareness must become a standard part of the curriculum for UM researchers. The UM also needs to provide a Research Data Management capability to support researchers in creating FAIR data and a Publication Management capability to help researchers publish under Open Access.



This is a summary of all our strategic directives from different sources, of which implications of some directives are still in research.

2. What does the UM want ? Operations view

MISSION / LONG TERM GOALS

Provide optimal support with minimal bureaucracy for education and research, guided by the principles of transparency, sustainability and accessibility.

DERIVED GOALS CURRENT STRATEGIC PERIOD

Creating physical & digital (1) **Open Workspaces** to facilitate the CORE strategy. Supporting the Brightlands campuses by creating state-of-the-art (2) **research labs**. Contributing to UM (3) **sustainability** along the lines of the UM sustainability program. (4) **Lower bureaucracy**, increase efficiency and improve quality of data by implementing holistically designed (“integrale bedrijfsvoering”) and fully digitized generic operations processes. Further improve the availability of (5) **steering information** by means of business analytics.

STRATEGY

Create state of the art facilities when it comes to differentiating activities regarding education and research and strive for operational excellence when it comes to non differentiating generic processes.



IMPLIED BUSINESS CHOICES

Setting ambitions, analyzing problems and designing solutions will be done holistically instead of per functional domain. The non differentiating processes will be uniform for the whole UM and will be modelled to align with a market best practice.





This is a summary of all our strategic directives from different sources, of which implications of some directives are still in research.

2. What does the UM want? Technology view

MISSION / LONG TERM GOALS

To provide state of the art, flexible infrastructure (network, storage, server), connective tissue (integration, I&AM, BW), and consulting services to safely enable (i) running the university, (ii) connecting the university and (iii) differentiating the university.



DERIVED GOALS CURRENT STRATEGIC PERIOD

(1) Creating a (big) data infrastructure. (2) A server landscape (pipeline) plus IT management processes software that can facilitate an agile way of working where appropriate. (3) Enablement of the transition to a hybrid environment (on premise/cloud solutions). (4) Enablement of a fast track for developing custom apps and enterprise applications.

STRATEGY

Encourage close multi disciplinary collaboration with the internal customers to ensure the services optimally align with their (changing) needs. The services will be guided by a clear IT architecture and employees will be given ample opportunity to keep updating their knowledge of current and emerging technologies. People will also be trained to align their mindset and skillset to the refocus IT organization manifest. Besides, we will work out a “cloud, unless” strategy.



IMPLIED BUSINESS CHOICES

Due to the gradual transition towards using more cloud solutions the emphasis on keeping the lights on will decrease (technical and application maintenance will be done by the Cloud Service Provider) while the demand for other capabilities will increase (cloud architecture, vendor management). Some people will have to be aided in finding and transitioning to their new role.



3. WHERE DO WE COME FROM ?

Improving starts with understanding where you are coming from. Some milestones of the past.

4. WHERE ARE WE NOW ?

Defining some insights of our current state of affairs in the I-domain. Our starting point in the way ahead.



3. Where do we come from?

Our journey in the I-domain

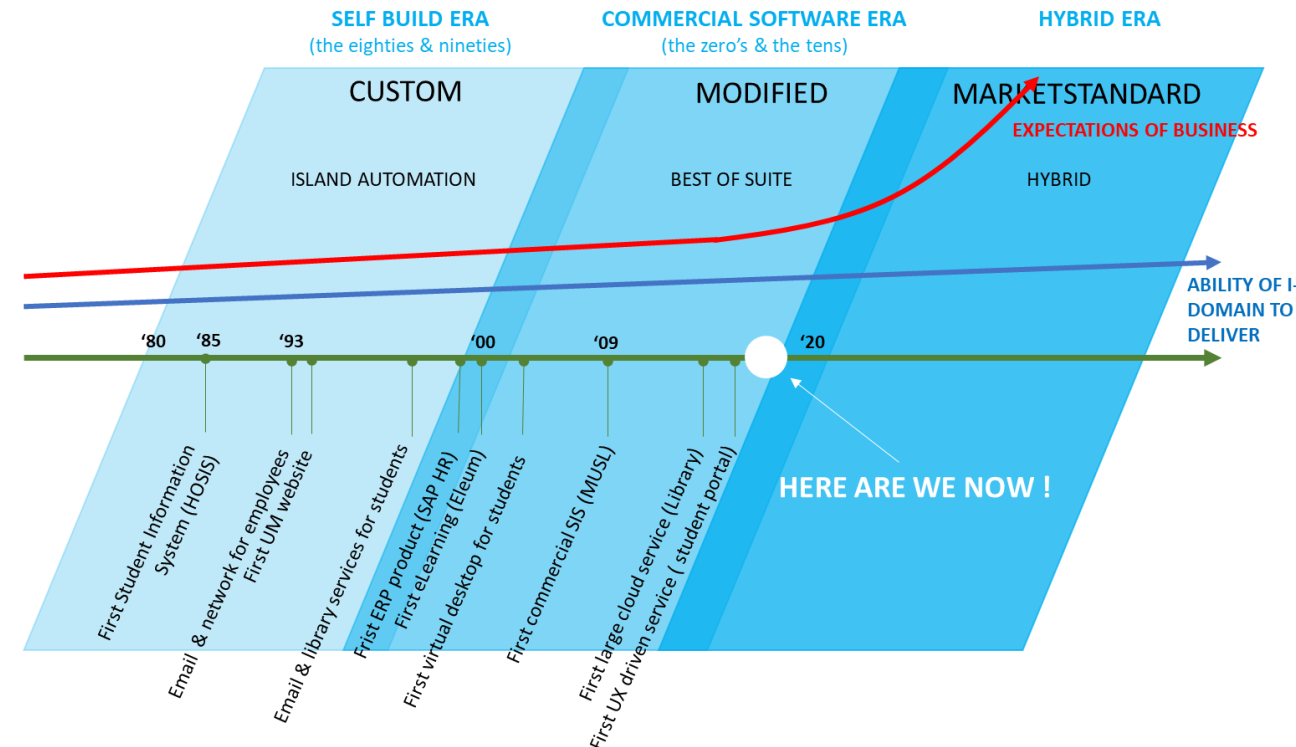
FROM BACKEND TO UX

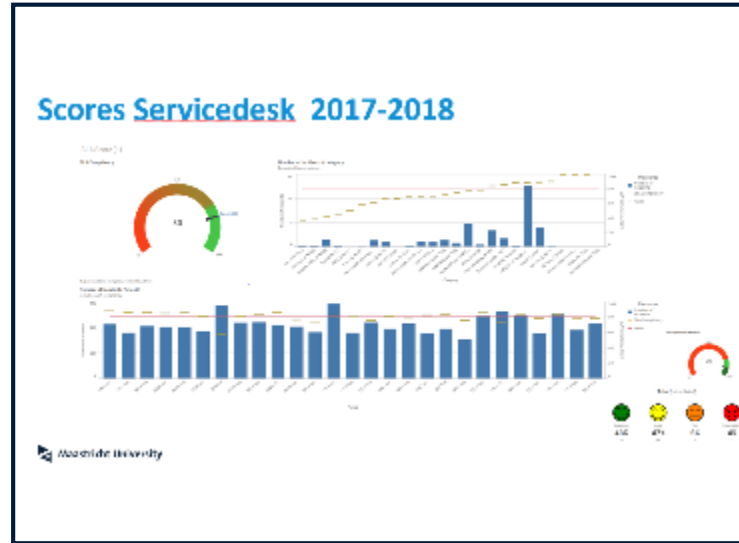
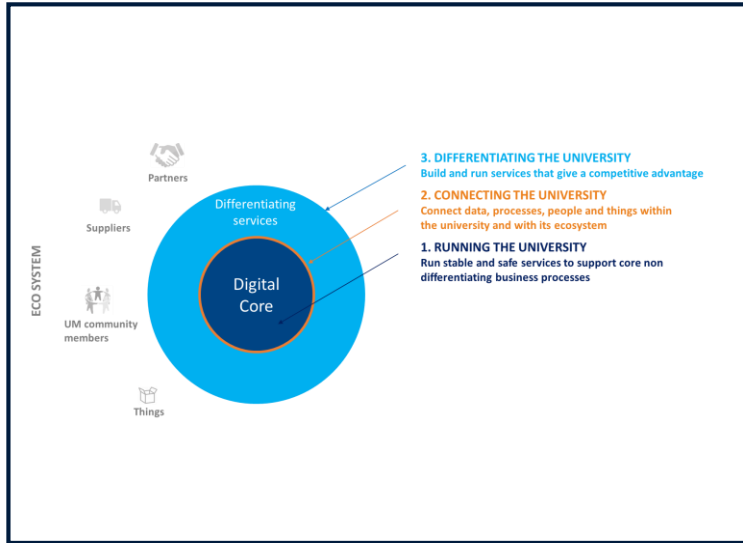
Our I-domain journey starts around the early '80's with implementing our first stand alone Student Information System (HOSIS) to digitize our main administration. The next milestone was the creation of our first MAASnet which gave our researchers digital access to our data & computing center and which introduced the use of email.

The next era is marked by the implementation of our first commercial software SAP HR and Eleum and a few years later SAP SLcM (MUSL): a new student information and a scheduling system (S+). This SAP based system was implemented across all faculties with their own specific demands and their corresponding costs. This system mainly supported the backend processes. The information delivery and communication towards students however was still poor.

This insight (2013) marked the start of the period of “de gebruiker centraal” that placed much more emphasis on the User Experience (UX) of the end-user (e.g. students). During the last few years the UM has made some progress in this field by introducing the Student Portal. During this period the UM also started to use its first big cloud services (library services).

The coming era the expectations of students, teachers and researchers will increase fast due to all the digitalization they see around them in their everyday lives. Will the I-domain be able to live up to their expectations?



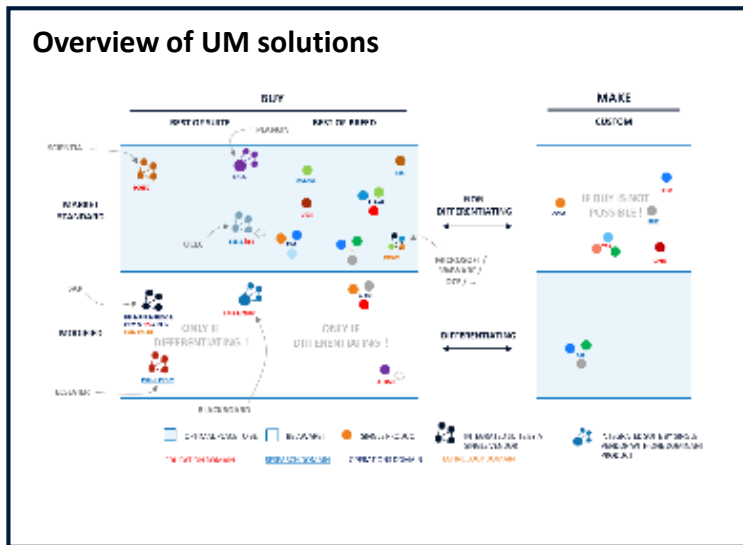


What's our core focus?

The I-Domain is mainly preoccupied with running the university: using information technology to support back office and some education processes. There is little focus for adding real value to education and research.

Keeping the lights on, but...

93% of our spending is used for “keeping the lights on” and doing some minor modifications. The quality of that service is good, although the perceived quality might be different. Meanwhile almost no capacity is available to innovate the UM with IT.



Technology is expensive...

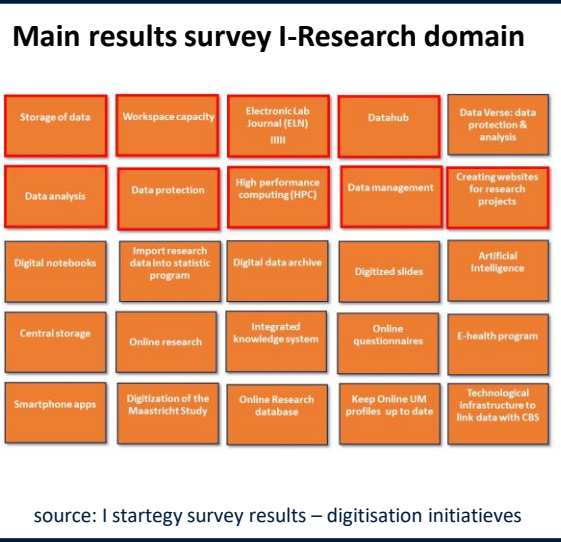
The information awareness of the UM as a whole is low and stuck in early zeros. We are still looking at technology as a necessary evil that's too expensive. We are not talking about real business value.

Organizational silo's

We are working in our organizational silo's. We miss an integrated approach focusing on the results. In our day-2-day conversation we show socially desirable behavior instead of engaging in the real conversation.

4. Where are we now?

The As-Is situation explained per domain.



Education

Based on first impressions, the digital awareness is low leading to a situation where both the possibilities and the threats IT represents to the Education domain are underestimated. The current focus is on supporting education logistics and administrative processes and tailoring to the specific needs of the faculties for non differentiating processes. The innovation efforts within the primary education processes that do take place lack the coherence of an overall I-vision for education and are rarely scaled up beyond the pilot phase. Despite the fact that Life Long Learning (LLL) is considered important, almost all attention goes to “regulier” education. The digitalization of “niet regulier” education (LLL) is very low, inefficient and fragmented.

Research

The usage of IT in making new scientific discoveries is increasing. The availability and usability of good research data is key. In line with the Open Science philosophy, funding partners are more and more demanding not only good financial governance but also good data governance. Therefore the research domain is in direct need for good technical data facilities (storage, transfer, meta tagging) and supporting services like data scientist for analysing data and data stewards for helping them manage data correctly.

Operations

Despite the fact that generic operations processes are mostly non differentiating and for which best practices have long been around, the digitalization level for these processes at UM is still considered low. The lack of standardization and digitalization leads to people doing relatively simple repetitive manual tasks that offer little business value, is inefficient and error prone.

Technology

The technology domain is aimed at and equipped for running the current solutions in their own data centre (on premise) with a waterfall way of working. The domain is risk averse. Costs (asset optimization), security and stability are the main drivers. There is little to no room for exploring new technologies and ideas leading to a low technology push.

5. WHAT DO WE WANT TO ACHIEVE IN THE I-DOMAIN ?

Specifications of the main I-Domain goals based on UM strategic goals and expectations of the UM community.

6. WHAT IS NEEDED ?

Specification of the needs in the I-domain regarding People, Process and Technology.

7. WHAT TO INVEST IN?

The I-agenda: Specifications of the main investment themes per domain.

8. DISCUSSION POINTS

Specification of discussion points at this stage of the I-strategy process.



5. What do we want to achieve in the I-domain?

Three KPI's defined for the I-domain

CREATE VALUE

We want to make the transition from using IT just to support non differentiating processes to using IT for **creating real value** for the UM in both **education and research**.

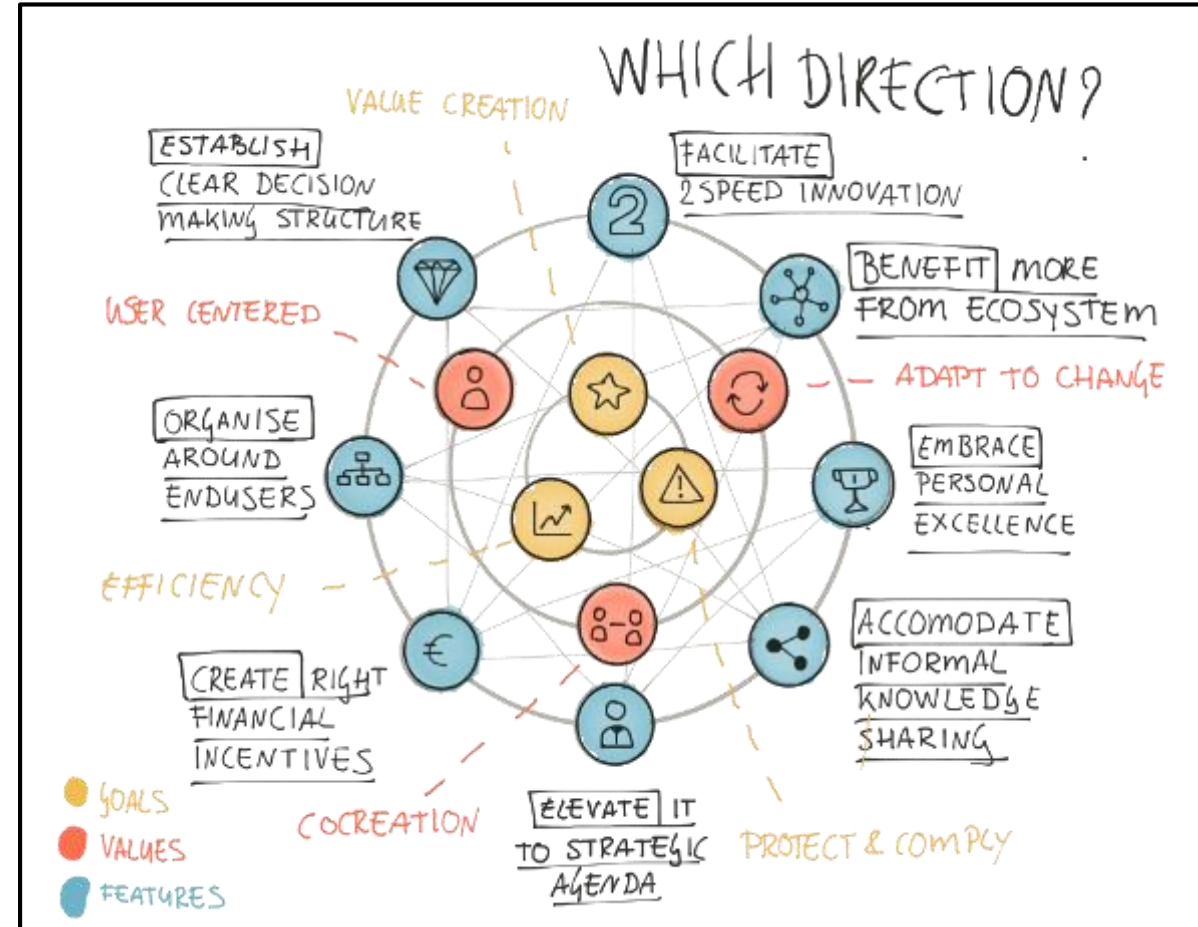


BE EFFICIENT

We want to spent less on „keeping the lights on“ and more on innovation. **The aimed ratio is 70/30**. We want to be agile and transparent in what we deliver and at what cost.

PROTECT AND COMPLY

We want to ensure business continuity, **protect our data and assets** and **comply with** security and privacy related **regulations** like GDPR.





6. What is needed?

Improving in People, Process & Technology

PEOPLE

- **I-literacy:** Increase I-literacy by improving awareness and knowledge of both staff & students. Understanding the impact of digitization and the use of data related to security, privacy and FAIR data principles.
- **Skillsets:** I-leadership to guide the organization in making optimal use of I&T. A coaching managerial style and a T-shaped skillset with a value driven and user centered mindset is needed to be able to work in multi disciplinary teams with End2End process responsibility that create real value.
- **Capacity:** (Re)allocation of resource capacity is necessary because of the shift in work. From “running” capacity to area’s like security, data stewards, and project management.

PROCESS

- **Process uniformization:** Uniformization of non differentiating processes to a market best practice to lower costs, increase innovation speed and to free up resources for creating real value for education and research.
- **Multi-disciplinarity:** Multi-disciplinary team responsibility for End2End processes instead of processes that cross multiple organizational (and therefore responsibility) silo’s.
- **Outside in:** Processes need to be designed from the outside in (customer journey) and in co-creation with the UM community members as to maximize the business value.
- **Risk & compliancy:** Implementing Security-Operations-Center processes to ensure business continuity and compliancy.

TECHNOLOGY

- **Leverage cloud:** Leverage cloud for non differential processes to make optimal use of innovations by vendor and to reduce time and resources spend on keeping the lights on;
- **Open workspace:** A digital and non digital workspace where people can work any time, any device, anywhere. It is open, so we can collaborate cross domain, cross faculty, and cross nations.
- **IT4IT:** Integrated processes and technology that supports the whole IT value chain and can facilitate agile and dev/ops work methods and rapid application development
- **Infrastructure:** An infrastructure (network, storage and servers) that enables handling big data.



6. What is needed? Education perspective.

Improving in People, Process & Technology

PEOPLE

I-literacy: Increased digital awareness and I-literacy among teaching staff is needed to be able to both see the possibilities and threats that digitization brings in higher education. This is a pre-requisite for the much needed I-leadership and to make sure new digitization initiatives are actually being used

I-support: Facilitate teaching staff with specialized knowledge regarding the usage of emerging technologies in education for example by collaborating with Edtech companies.

Create space for innovation: The teaching staff must be given real space (time, resources and facilities) for educational I-innovation. Creating real career paths in education, not just in research, can partly help in realizing this ambition.

PROCESS

Process uniformisation: Starting uniformisation of non differentiating processes (educational logistics & admin) to a market best practice to facilitate educational flexibility, increase innovation speed and to free up resources (lower admin burden staff) for creating real value for education.

Operationalize education strategy: For the elaboration of the I domain with regards to the education strategy we need to investigate concepts such as: How to strengthen the relationship between research and education (CORE), the development of flexible education concepts (personalised learning paths), and the development and implementation of constructive alignment as an approach for development of programmes, with a focus on for instance new approaches to assessment.

TECHNOLOGY

Open workspace: A digital and non digital workspace where students and teaching staff can work together any time, any device, anywhere. In every building we have digital free zones to stimulate the real conversations among students and with teaching staff.

Support education: The improvement of the digital experience for students, teachers and lead & applicants.

Deliver education: Once the implications of EdView have been operationalized, the I-domain can determine how technology can be used for (1) **enrichment of students' learning process** by using technologies like AI & cognitive computing, augmented & virtual reality or serious gaming or (2) **adaptive learning** by usage of technologies like a digital assessment and examination platform and /or an adaptive learning platform



DIGITAL FREE ZONE



6. What is needed? Research perspective.

Improving in People, Process & Technology

PEOPLE

I-literacy: Increase I-literacy by improving awareness and knowledge of research staff. Understanding the impact of digitization and the use of data related to research.

Capacity: Support research staff with extra data stewards, data engineers and data analysts to support individual research projects.

I-Skills: Making all researchers data aware regarding security, privacy (GDPR), the Open Science philosophy and the related FAIR data principles.

PROCESS

RDM process: Flesh out the concept of FAIR data for the various types of research as to determine what needs to be done (Research Data Management) in order to become “FAIR”.

CDDI : A community that disseminates knowledge around FAIR and AI/ML and helps researchers getting more out of their research.

Researcher experience: Co-create the researcher journey (common denominator) to determine what kind of research support is needed during all phases of a research project. This information can then be used to design processes like RDM and Pre and Post Award Management.

TECHNOLOGY

Deliver research - Infrastructure: An infrastructure that enables the handling of big data. This infrastructure consists of (1) sufficient data storage capacity, (2) sufficient network bandwidth (within the UM and to the outside world), (3) data transfer facilities , (4) a Research Data Management platform and (5) a link of the UM data lakes to the Open European Science Cloud.

Support research - Pre and Post Award Management : A pre and post award management platform that guides and facilitates the researcher with all the supporting content, knowledge, functionalities and services the UM has to offer during the stages of the lifecycle of a research project.



6. What is needed? Operations perspective.

Improving in People, Process & Technology

PEOPLE

I-literacy: Increase I-literacy by improving awareness and knowledge of staff (for example with regard to Information Analysis). Understanding and exploring (new) ways of working with IT in day-to-day business as well as in innovation, and becoming aware of security and privacy issues.

Reallocating capacity: By uniforming, digitizing and automating generic operations processes there will be less demand for people doing relatively simple repeating tasks and more demand for analytic and consulting work. There is also a demand for programme/project management.

I-skills : People need to be trained in both the concepts and methods of agile working.

PROCESS

Process uniformisation: Uniformisation to a market best practice of our non differentiating processes of HRM, Finance & Procurement. In this uniformisation we use the holistic (integrale bedrijfsvoering) approach: all operations processes should be aligned with each other, done by a multi disciplinary team.

Organization structure: The organizational structure as depicted in the IT systems should be a representation of the real organizational structure so this information can be used in digitizing processes;

Business intelligence: provide relevant management information (digitally accessible) to monitor KPI's. BI may also be used in research and education decision making.

TECHNOLOGY

Open workspace: A digital and non digital workspace where staff can work any time, any device, anywhere. It is open, so we can collaborate cross-faculty and between all disciplines. We use a pilot environments (called DXP) to build the open digital workspace on.

Operation suites: Adhering to a market best practice (a cloud suite) for delivering full digital support regarding HRM, Finance and Purchase 2 Pay.

Connective tissue: The technology domain must facilitate the needed integration and I&AM capability for the operations domain to be able to connect companies, people, data, processes and things.



6. What is needed? Technology perspective.

Improving in People, Process & Technology

PEOPLE

I-literacy & capacity: In-depth knowledge and capacity is needed for (1) IT architecture, (2) Integration, (3) Identity & Access Management, (3) Cloud (not just technical), (4) Supplier Management, (5) (new) system development processes, and (6) Security.

Reallocating capacity: The partial transition to the cloud will mean that less application and technical management roles will be needed. Extra capacity in security and data engineers are needed.

I- Skills: People (not just in IT) need to be trained in both the concepts and methods of agile working and IT4IT (The Open Group).

PROCESS

IT management processes: A redesign of the IT management processes in order to provide maximum value for the business (e.g. IT4IT framework of The Open Group).

Faster decision making process: The business needs to be able to make decisions much faster to be able to keep up with the speed of agile development. The Technology domain should focus on results instead of process.

App center: An app center that helps the business with the whole lifecycle for custom apps.

Cloud CoE: A cloud Center of Expertise that helps the business with all aspects related to selecting and managing cloud solutions.

TECHNOLOGY

Hybrid Integration Platform: An integration platform that can handle (1) Integrations to mobile devices, (2) Cloud2ground and cloud2cloud integrations and (3) IoT integrations

I&AM suite: A platform that can handle the correct access to resources in a mobile and hybrid environment.

Rapid Application Development platform: A platform based on the Model Driven Development technique (low code or no code) that can support the complete lifecycle of a custom app.

IT4IT: Integrated IT4IT that support the whole IT value chain and can facilitate agile and dev/ops way of working.

Big data infra: An infrastructure (network, storage, servers) that can handle big data sets.



7. What to invest in?

This is for now our first impression of the I-agenda



Discussion points and don't knows

What do we want to clear up before finalizing the I-strategy

OPERATIONS

Non digital workspaces: Do we need explicit *non* digital workspaces for our UM staff to strengthen the real conversation?

Open workspaces: What is the scope of open workspaces: a collaboration environment for supporting staff only or for all UM employees ?

TECHNOLOGY

HPC facilities: Must the UM also facilitate its own High Performance Computing (HPC) facility or will the UM use HPC facilities from other institutions?

IaaS: Centralize the IaaS services using the portal cumulus service of SURF (to manage all different IaaS service providers) or let everybody manage their IaaS services (and contracts) themselves ?

RESEARCH

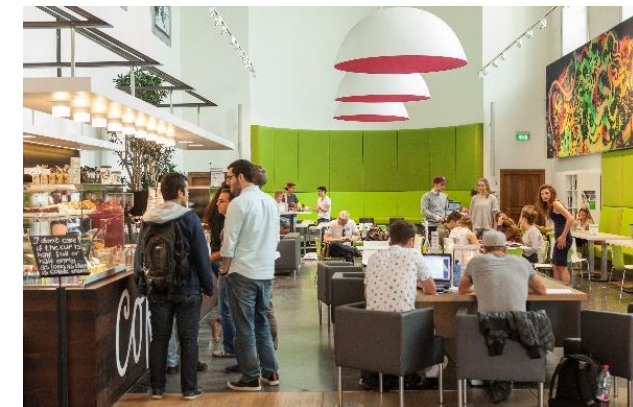
FAIR data: As UM we want to be the first Dutch “FAIR university”. A SMART definition of the FAIR objectives is still lacking. Besides, being FAIR in 2025 will not guarantee that we’ll be the first Dutch FAIR university. To realise this ambition, 2023 will be a better deadline.

AI/ML: Is the usage of an Artificial Intelligence/Machine Learning capability in all sorts of UM research really a key strategy for being able to deliver high impact and relevant research output?

EDUCATION

UM graduate profile: What is the common denominator of the UM graduate profile that applies to all UM graduates and what elements are program specific ?

Education strategy: The I-domain will only be able to add real value to the primary education processes after the implications of EdView have been operationalized. For the I-domain these are some of the important questions that need to be answered first, like “What will PBL 2.0 look like?”, “What does personalized learning pathways mean at UM?”, “What does flexible education mean at UM?”, “Does the UM want to offer adaptive learning and if so what does it mean at UM?” and “Is Life Long Learning really a main goal for the UM and if so, is it feasible for all programs / faculties?”







IT Board sessions:

- Session 1: 18 April 2018: ***Operations & Technology***
- Session 2: 28 Mei 2018: ***Education & Research***
- Session 3: 25 June 2018: ***Discussion I-Strategy Draft Version***

Workshop Sessions:

15.05.2018 Education Domain

23.05.2018 Education Work Session

24.05.2018 Reserach Work Session

31.05.2018 Information Managers Session

Internal documents

- Maastricht University. (2017). *Community at the CORE. Strategic programme 2017-2021.*
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External documents

To be completed.



WHAT BUSINESS CHOICES ARE IMPLIED BY THE EDUCATION GOALS ?

1. **UM UNIFORMATION OF EDUCATION SUPPORT PROCESSES**- The UM should adhere to a best practice business process for non-differentiating business processes like recruitment & admission, student & course administration, scheduling , curriculum and course catalog management;
2. **TRINITY OF STANDARDIZATION**- Process, information and application standardization and decision-making power for a (group of) business capabilities must be organized at the same organizational level. →☰
3. **IMPROVE I-LITERACY**- Staff and students need to be trained in both generic and discipline specific I-skills and knowledge;
4. **CREATE SPACE FOR INNOVATION**- The teaching staff must be given real space (time, resources and facilities) for educational innovation. Creating real career paths in education, not just in research, can partly help in realizing this ambition.
5. **TEACHER SUPPORT**- Digitization in education is teamwork where teachers need to be supported by specialist in fields like online didactics, instructional design, video and social media;
6. **PROGRAMMATIC DIGITAL ASSESSMENT**- The assessment of students should not be done per course but on a programmatic level based on competency requirements;
7. **EDTech CO-CREATION**-Increase quality and speed of digital innovations in education by working closely together with EDETech companies;
8. **SINGLE STUDENT HELPDESK**- Students should have a single helpdesk that they can turn to regardless their question or problem;
9. **OUTSIDE IN THINKING**- When designing a new service or adjusting an existing one, the value as perceived by the UM community member (student, teacher, researcher) should be leading;

Depending on the outcomes of the investigation of the desirability of offering personalized learning pathways the following might also be needed:

1. **OPEN EDUCATIONAL RESOURCES**- The usage of Open Educational Resources should be stimulated within the UM to increase both the efficiency, availability and quality of course and assessment material;
2. **ALIGNING COURSE SCHEDULES**- The startdates for courses and exam periods should be the same for every faculty;
3. **OPEN CURRICULA**- Curricula must be able to handle the incorporation of research and societal learning elements (CORE) and personalized learning paths;
4. **ACKNOWLEDGEMENT OF MICROCREDENTIALS**- The UM should acknowledge microcredentials (badges) to show the extra curricular activities done by the student.



WHAT BUSINESS CHOICES ARE IMPLIED BY THE RESEARCH GOALS ?

1. **OPEN SCIENCE**- The UM embraces the Open Science philosophy for her research approach;
2. **STANDARDIZED RESEARCH SUPPORT PROCESS & PROTOCOLS**- The research support process and protocols are standardized for the whole UM according to international standards;
3. **TRINITY OF STANDARDIZATION**- Process, information and application standardization and decision-making power for a (group of) business capabilities must be organized at the same organizational level. →☰
4. **I-LITERACY**- All researchers need to be trained in both generic and discipline specific I-skills and knowledge;
5. **SCIENCE AGENDA**- To increase the success rate of grant applications the UM will create research proposals that are clearly aligned with the Dutch and/or European science agenda themes;
6. **RESEARCH DATA MANAGEMENT CAPABILITY**- The UM should facilitate her researchers with a Research Data Management (RDM) capability to help them to create FAIR data;
7. **PUBLICATION MANAGEMENT CAPABILITY**- The UM should facilitate her researchers with a publication management capability to help them publish their results and data under Open Access;
8. **EUROPEAN OPEN SCIENCE CLOUD**- The UM big data lakes are linked the [European Open Science Cloud](#).
9. **OUTSIDE IN THINKING**- When designing a new service or adjusting an existing one, the value as perceived by the researcher should be leading;



2. What does the UM want ? Operations



WHAT BUSINESS CHOICES ARE IMPLIED BY THE OPERATION GOALS ?

- 1. HOLISTIC VIEW ON OPERATIONS (integrale bedrijfsvoering)**- The articulation of IT related ambitions and problems as well as the analysis, prioritization, the design and the implementation of IT (related) services within the generic operations domain will be done in a holistic manner by a multi disciplinary team that has representation of all the functional groups (Finance, HR, Facility etc) within this domain.
- 2. MARKET STANDARD**- UM wide uniformation of non differentiating generic operations processes to a best practice marketstandard;
- 3. BEST OF SUITE**- In line with the holistic view on generic operations (integrale bedrijfsvoering) a best of suite solution containing all generic operations (Finance, HR & Procurement) is the most logical option. If this is not attainable at least a best of suite option per functional domain (Finance, HR, Procurement) should be aspired.
- 4. TRINITY OF STANDARDIZATION**- Process, information and application standardization and decision-making power for a (group of) business capabilities must be organized at the same organizational level. →☰
- 5. OUTSIDE IN THINKING**- When designing a new service or adjusting an existing one, the value as perceived by the UM community member (student, teacher, researcher) should be leading;
- 6. DIGITAL SIGNATURE**- The acknowledgement of a digital signature so processes can be fully digital and therefore paperless;
- 7. ORGANIZATION STRUCTURE**- The organizational structure as depicted in the IT systems should be a representation of the real organizational structure so this information can be used in digitizing processes;



2. What does the UM want? Technology



WHAT BUSINESS CHOICES ARE IMPLIED BY THE TECHNOLOGY GOALS ?

1. **CLOUD FIRST**- There is a cloud unless policy for the end user applications (SaaS) and platform solutions (PaaS) with the exception of primary research applications and platforms. The selected cloud services and cloud service providers (CSP) need to comply with the UM cloud and CSP guidelines;
2. **RE-ALLOCATION OF CAPACITY**- Due to the gradual transition towards using more and more cloud solutions the emphasis on keeping the lights on will decrease (technical and application maintenance will be done by the Cloud Service Provider) while the demand for other capabilities will increase (cloud architecture, vendor management). Some people will have to be aided in finding and transitioning to their new role.
3. **ANY TIME, ANY DEVICE, ANYWHERE ACCESSIBILITY**- UM IT (enabled) services should be available any time, anywhere and with any device. Prerequisite however is the compliance of the service to the I&AM, security and data policies of the UM;
4. **RAPID APPLICATION DEVELOPMENT**- When a full stack application or app needs to be build the Model Driven Development method is considered first. Development based on a Model Driven Development platform is the fastest way available to create new apps.
5. **HOLISTIC IT4IT**- The backend IT processes that are supported with IT4IT should be approached in a holistic manner and be able to support both cloud delivery and an agile and DEV/OPS way of working. The various IT4IT tools should be integrated to optimally support the complete IT value chain according to the IT value chain model of The Open Group.
6. **INTEGRATION**- Applications (bought, build and cloud) need to comply with the technical connective tissue standards of the UM (integration, SSO, IAM service, Payment service) and the generally accepted semantic integration standards that are applicable for those types of applications in the market. The SURF standaarden wiki specifies these semantic standards;

OVERVIEW OF UM SOLUTIONS

EDUCATION DOMAIN

- eLEARNING (LMS)
- EDUCATIONAL LEARNING TOOLS (EDUC)
- STUDENT & COURSE INFORMATION (SIS)
- SCHEDULING & RESOURCEPLANNING (SCHED)
- TRAINING & EVENTS (TES)
- LIBRARY SERVICES (LIBS)
- DIGITAL EXAMINATION (DIGE)
- VIDEO SOLUTIONS (VIDS)
- EDUCATION QUALITY MANAGEMENT (EQM)
- ALUMNI SERVICES (ALUMS)

OPERATIONS DOMAIN

- HUMAN RESOURCES (HR)
- FINANCE (FIN)
- PROCUREMENT (PROC)
- FACILITY SERVICES (FACS)
- CUSTOMER RELATIONS MANAGEMENT (CRM)
- WEB COMMUNICATION (COM)
- LEGAL
- BUSINESS INTELLIGENCE (BI)
- ENTERPRISE INFORMATION MANAGEMENT (EIM)

RESEARCH DOMAIN

- PUBLICATION MANAGEMENT (PUB)
- PRE AND POST AWARD MANAGEMENT (PPAW)
- KNOWLEDGE TRANSFER OFFICE (KTO)
- PHD MANAGEMENT (PHD)
- SCIENTIFIC SEARCH ENGINE (SSE)
- DATA MANAGEMENT SOLUTIONS (DATAM)
- RESEARCHPROJECT SPECIFIC SOLUTIONS (RSS)

TECHNOLOGY DOMAIN

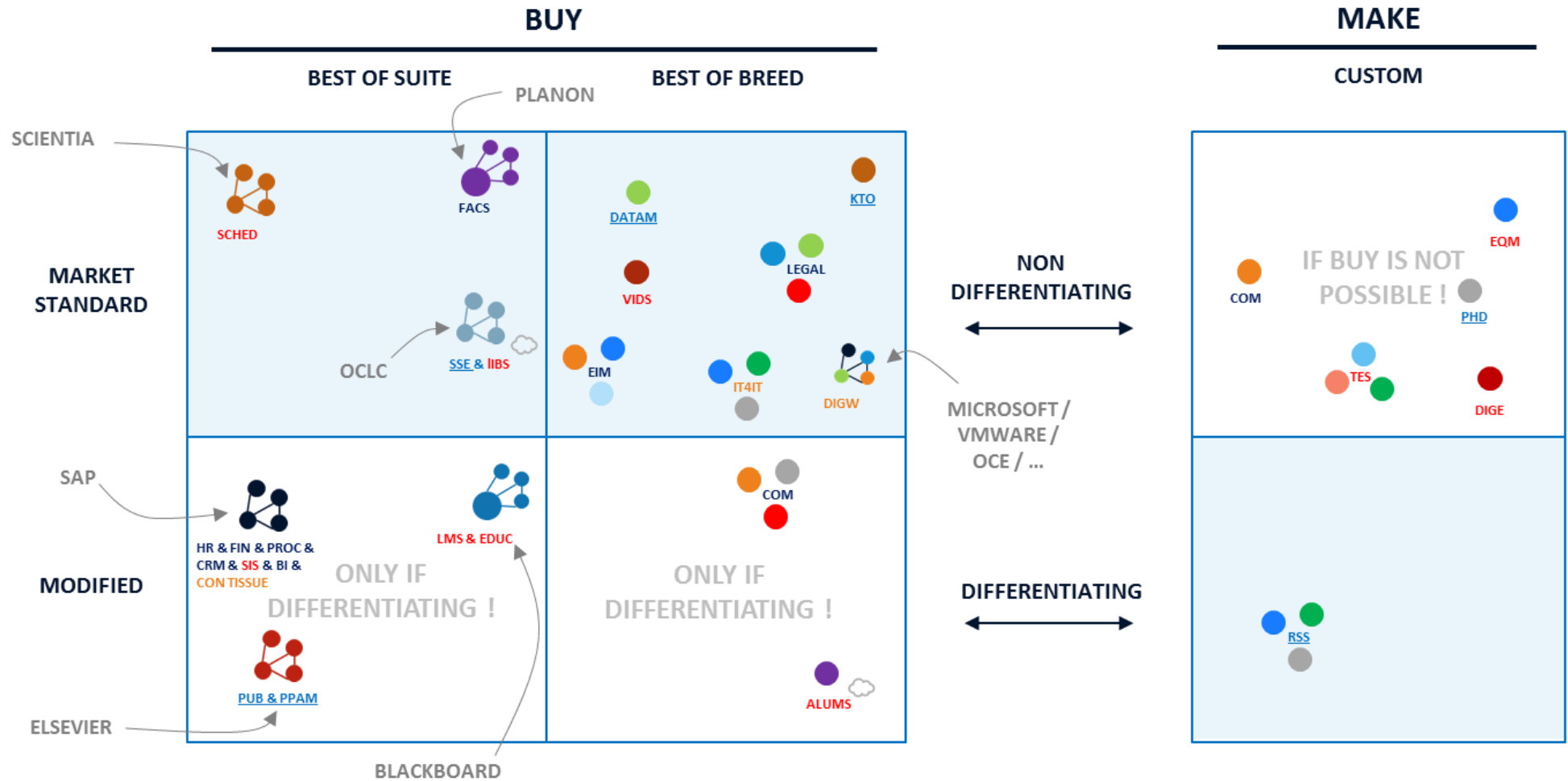
- DIGITAL WORKPLACE (DIGW)
- CONNECTIVE TISSUE (CON TISSUE)
- IT4IT
- *DATACENTER & NETWORK**

** The datacenter and the network are not considered solutions but infrastructure.*

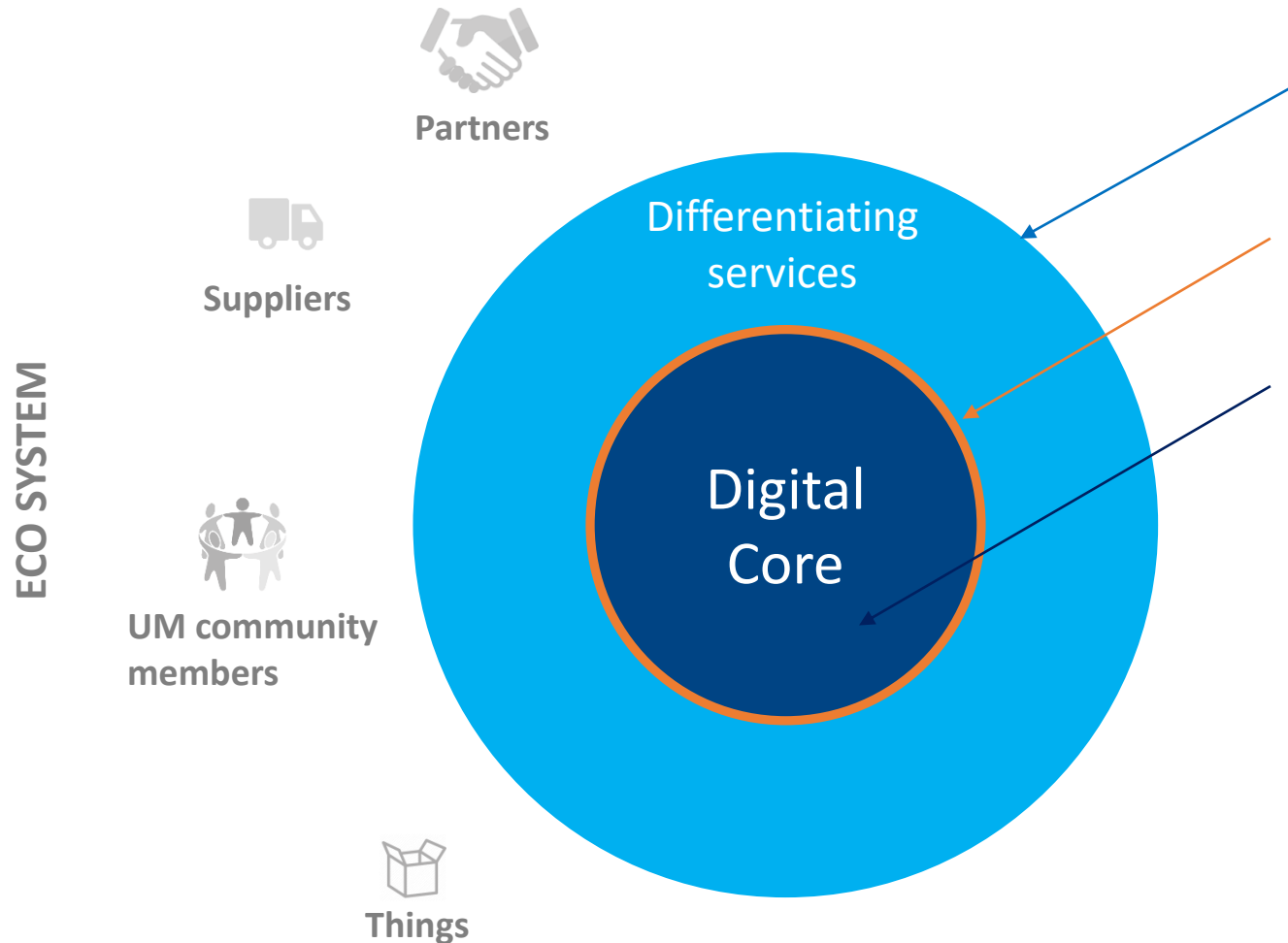
MAPPING OF SOLUTIONS



OVERVIEW OF UM SOLUTIONS



- OPTIMAL PLACE TO BE
- BE AWARE !
- SINGLE PRODUCT
-  INTEGRATED SUITE BY A SINGLE VENDOR
-  INTEGRATED SUITE BY SINGLE VENDOR WITH ONE DOMINANT PRODUCT
- EDUCATION DOMAIN
- RESEARCH DOMAIN
- OPERATIONS DOMAIN
- TECHNOLOGY DOMAIN



3. DIFFERENTIATING THE UNIVERSITY

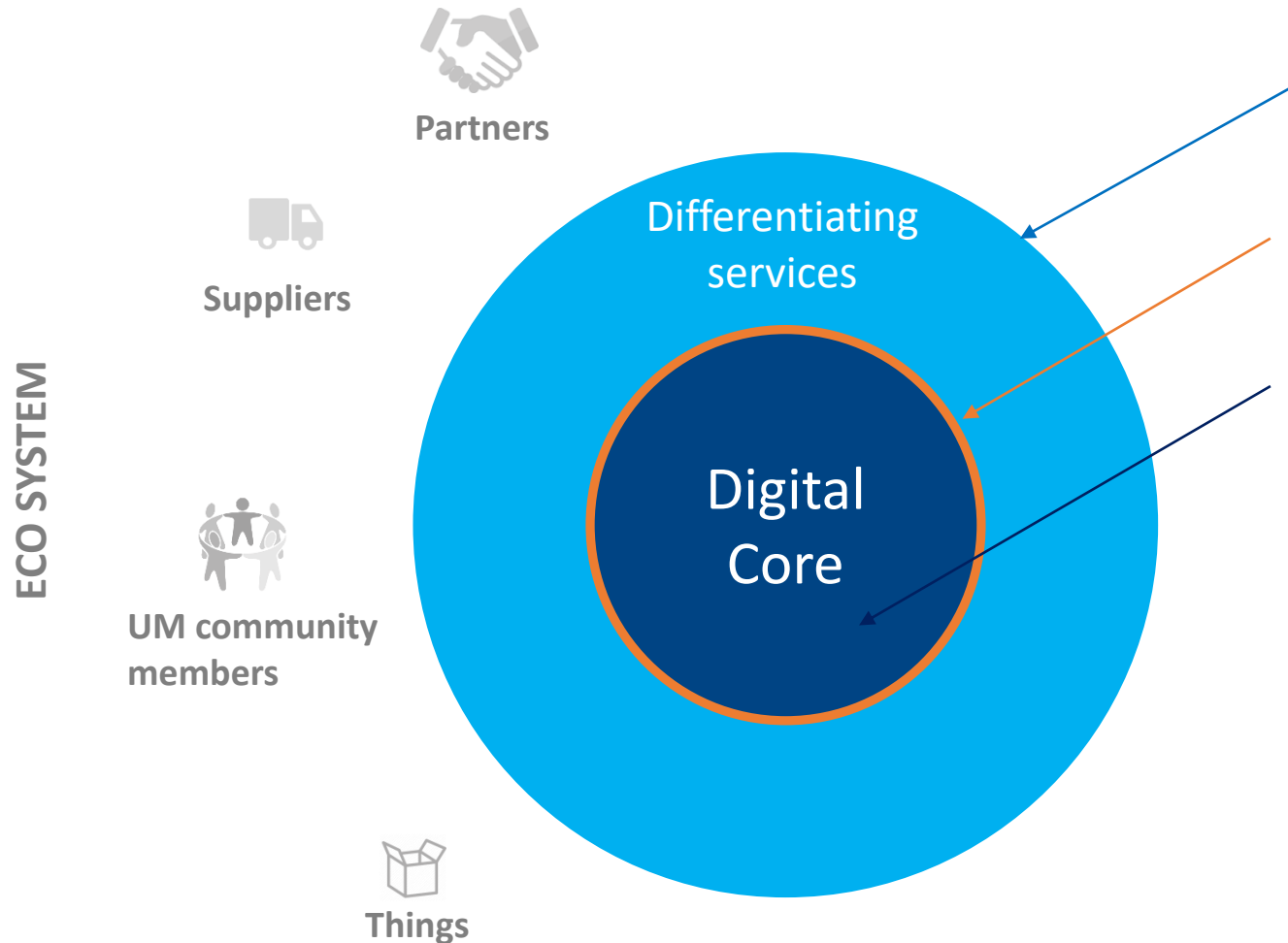
Build and run services that give a competitive advantage

2. CONNECTING THE UNIVERSITY

Connect data, processes, people and things within the university and with its ecosystem

1. RUNNING THE UNIVERSITY

Run stable and safe services to support core non differentiating business processes



3. DIFFERENTIATING THE UNIVERSITY

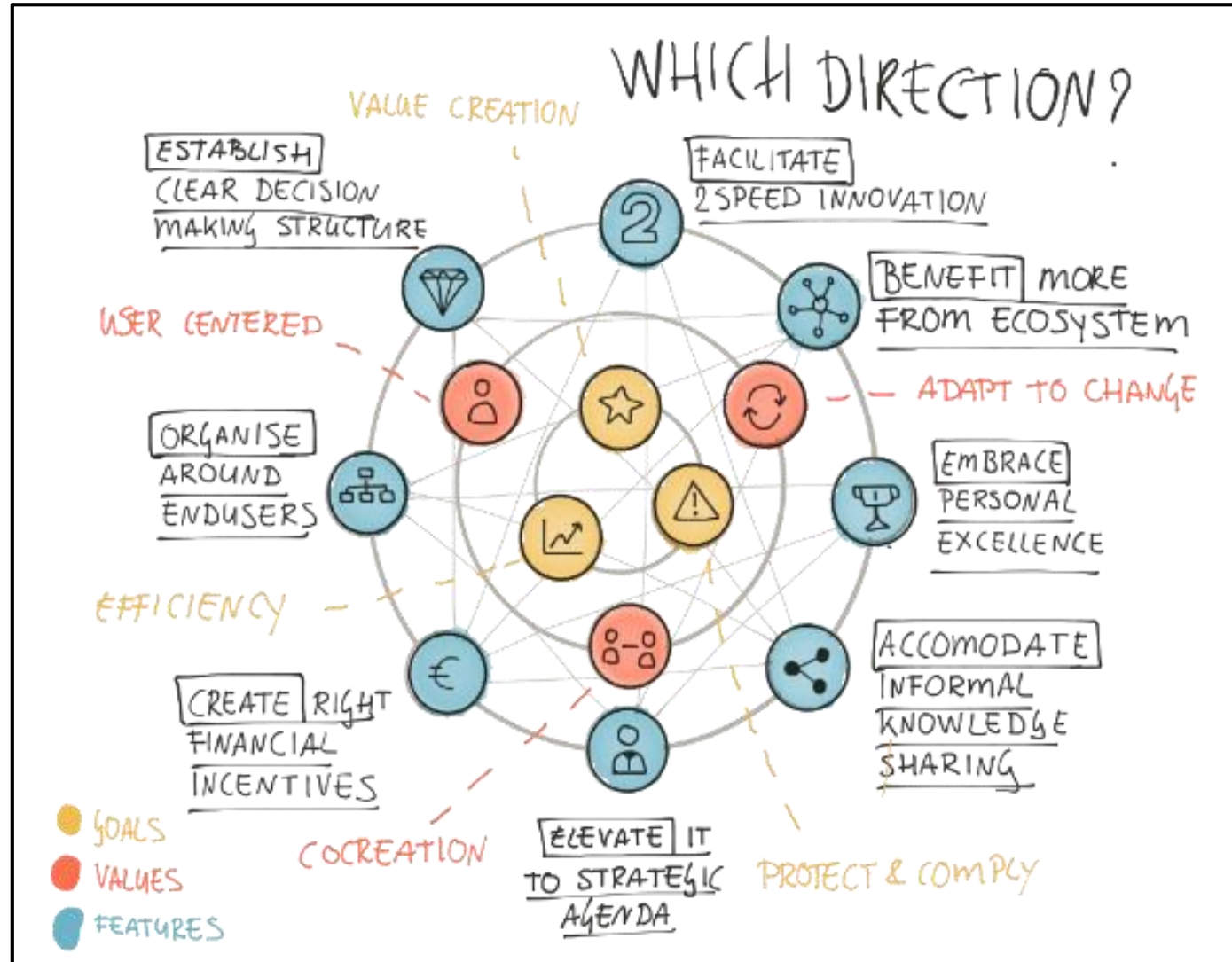
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5. What do we want to achieve in the I-domain ?

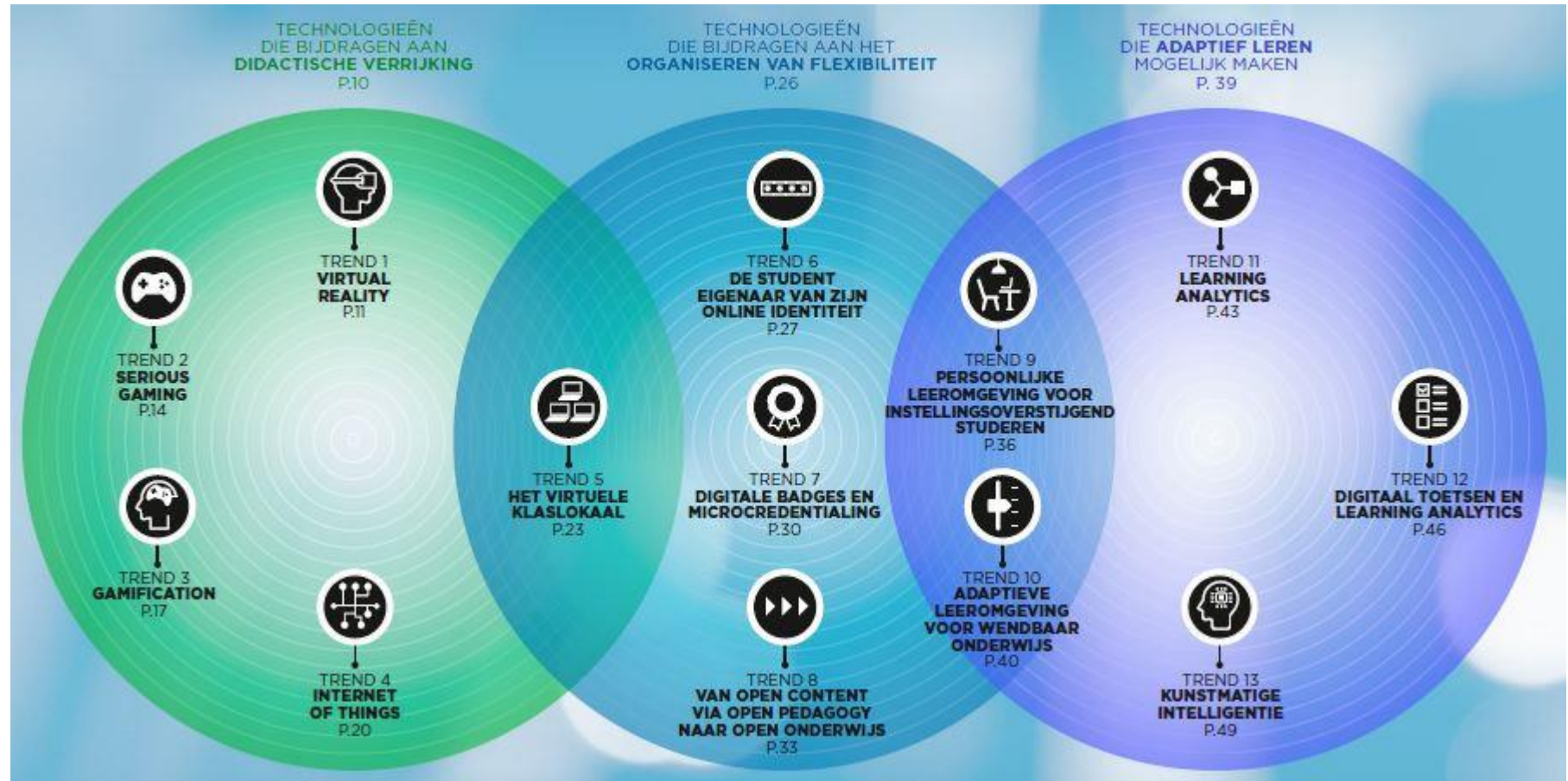
THREE AREA'S FOR POSSIBLE VALUE CREATION IN EDUCATION

DIDACTICAL ENRICHMENT

ORGANIZING FLEXIBILITY

ADAPTIVE LEARNING

Enrichment of the the student experience and offering more flexibility in the curriculum are important to the UM. The I-domain can help with that. However, further operationalization of EdView of the UM education strategy is needed to determine what I-investments are best suited for the UM. An overview of possible investments that have been mentioned sofar can be found here. 





Profile UM graduates

At Maastricht University we are committed to developing highly skilled, resilient and employable graduates provided with the demanded set of academic knowledge and competencies. We support students in setting goals and developing succesful plans towards their future. We want to ensure that students are able to adapt to change, whether it's change in employment opportunities, the unknown jobs of the future, societal change, or change in workconditions.

UM graduates*:

1. are able to come up with innovative solutions for real life problems;
2. are trained to work in multi disciplinary teams;
3. have hands on experience with scientific research;
4. are responsible global citizens that behave ethically;
5. have an entrepreneurial mind- and skillset;
6. are socially engaged;
7. are trained in self regulated learning needed to become a life long learner
8. are trained to thrive in an international work environment
9. possess the skills and mind-set to be able to handle working under uncertainty
10. possess 21 century hard and soft skills including digital skills and knowledge of digital technologies

* Do these 10 items represent the common denominator of the profile for all UM graduates ?

Possible I-initiatives in education domain

VALUE CREATION (POSSIBILITIES)

 DELIVER EDUCATION  SUPPORT EDUCATION

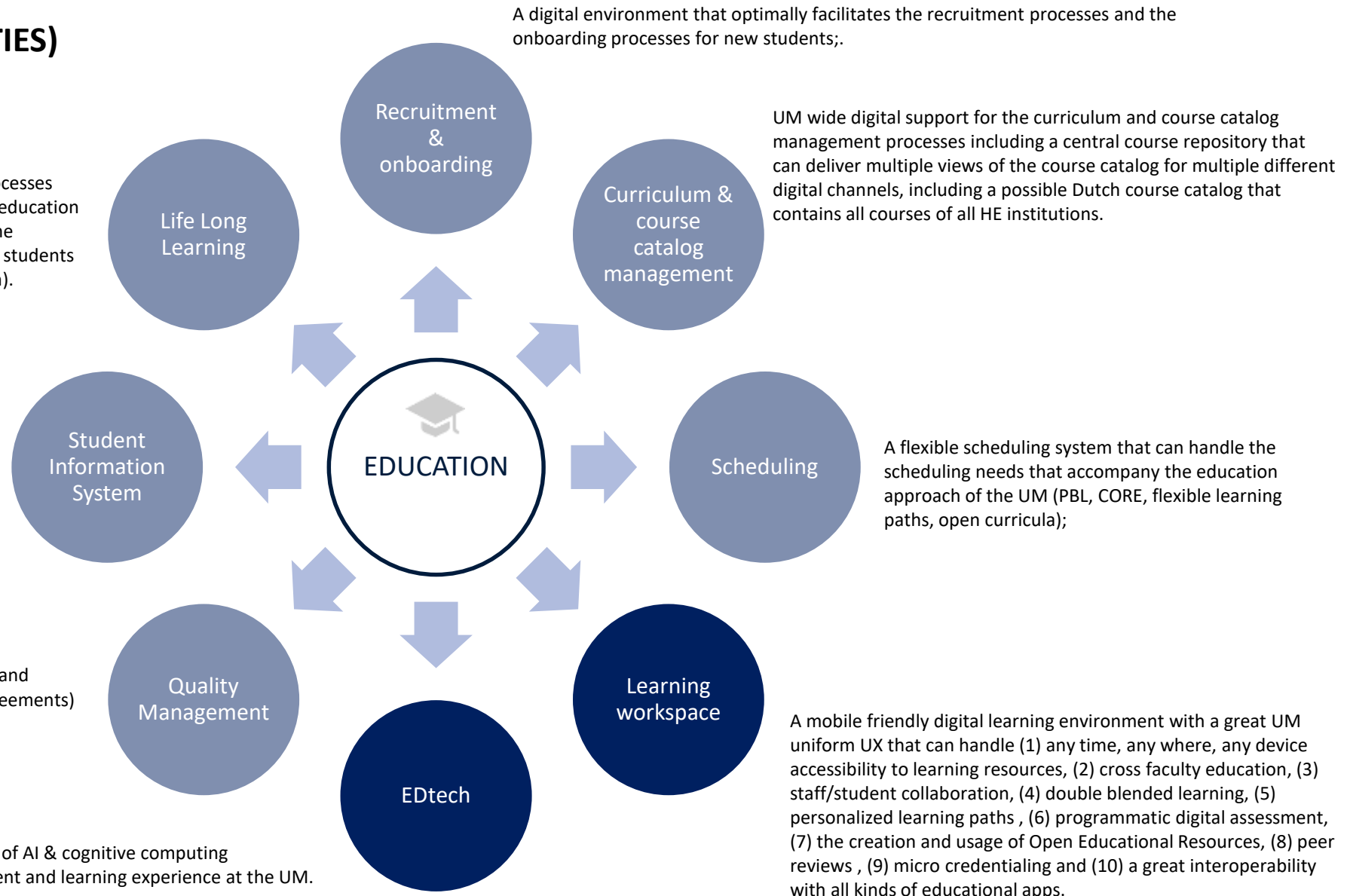
Mobile friendly full digital support for all administrations and processes related to contract education and other forms of “niet-regulier” education like trainings and events (Life Long learning). This also includes the availability of a Life Long Learning ePortfolio service in which the students themselves can manage their progress (also after UM graduation).

A mobile friendly student information system that can handle competency-based education, new forms of credentials (like micro credentials) and student driven personalized learning paths.

PRIORITIZATION BY BUSINESS IS NEEDED !

A quality management system for continuous monitoring and improvements of the education (including the Quality Agreements) that is partly based on learning analytics;

The facilities to explore the usage of AI & cognitive computing technologies to improve the student and learning experience at the UM.





VALUE CREATION (POSSIBILITIES)

DELIVER RESEARCH

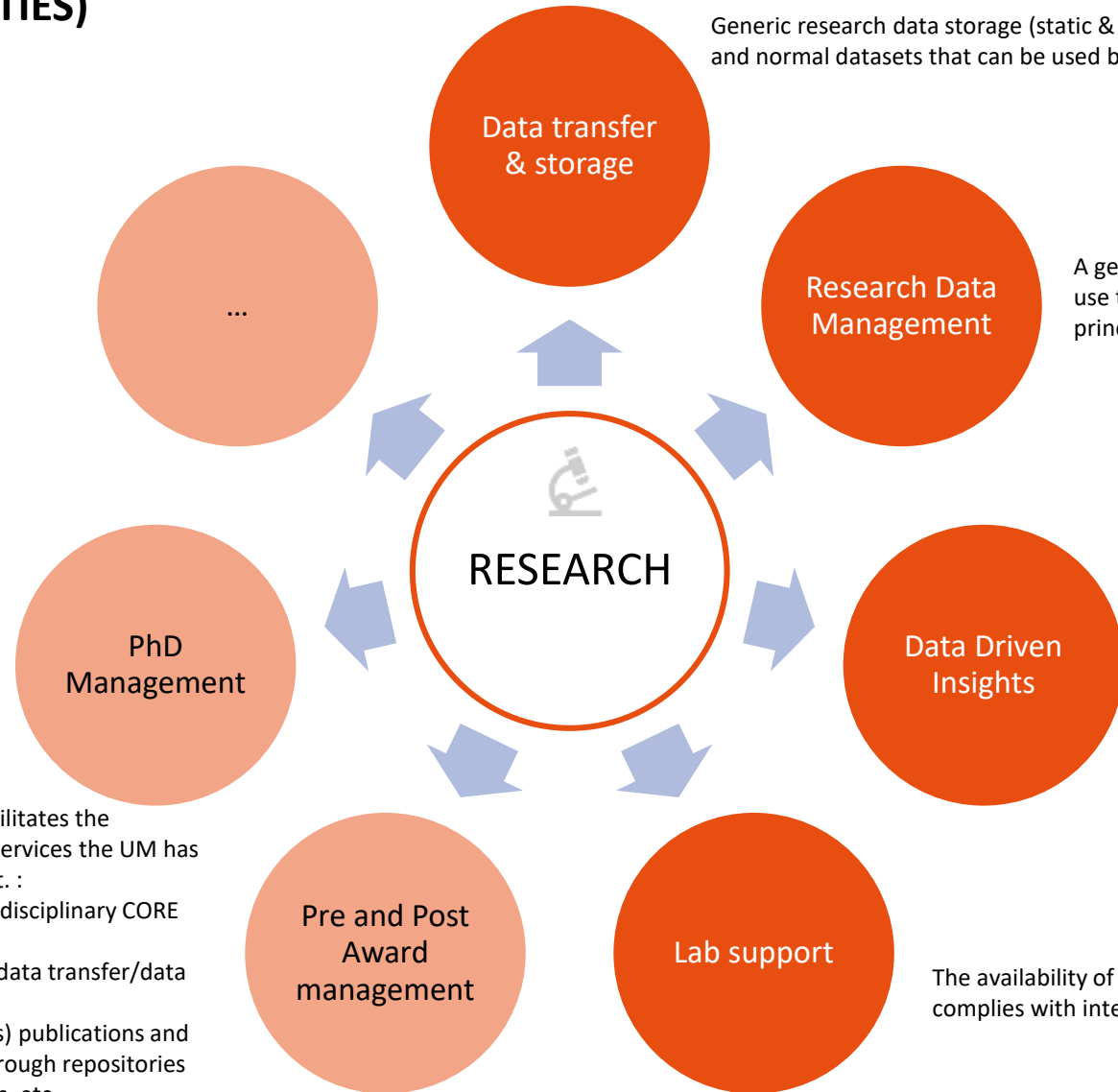
SUPPORT RESEARCH

PRIORITIZATION BY BUSINESS IS NEEDED !

A generic service to support the whole lifecycle of a PhD up until graduation.

A pre and post award management platform that guides and facilitates the researcher with all the content, knowledge, functionalities and services the UM has to offer during all the stages of the lifecycle of a research project. :

- Pre-grant: getting a grant (correct positioning esp. if it's interdisciplinary CORE project, preparation of RDM etc.)
- During-grant-period: do the research (access to services like data transfer/data storage, RDM, lab support)
- Post-grant: dissemination of the results through (open access) publications and make sure that the project stays "alive" after the end of it through repositories that provide access to the -static- data, visualisations, insights, etc.



Generic research data storage (static & dynamic) & data transfer facilities for both big data sets and normal datasets that can be used by all researchers.

A generic RDM platform service which researchers can use to have their datasets comply with the FAIR data principles.

A community that can help researchers "mine" big (unstructured) datasets and give them new data driven insights that they weren't able to find out themselves.

The availability of a UM standardized lab support system that complies with international standards.

Possible I-initiatives in operations domain

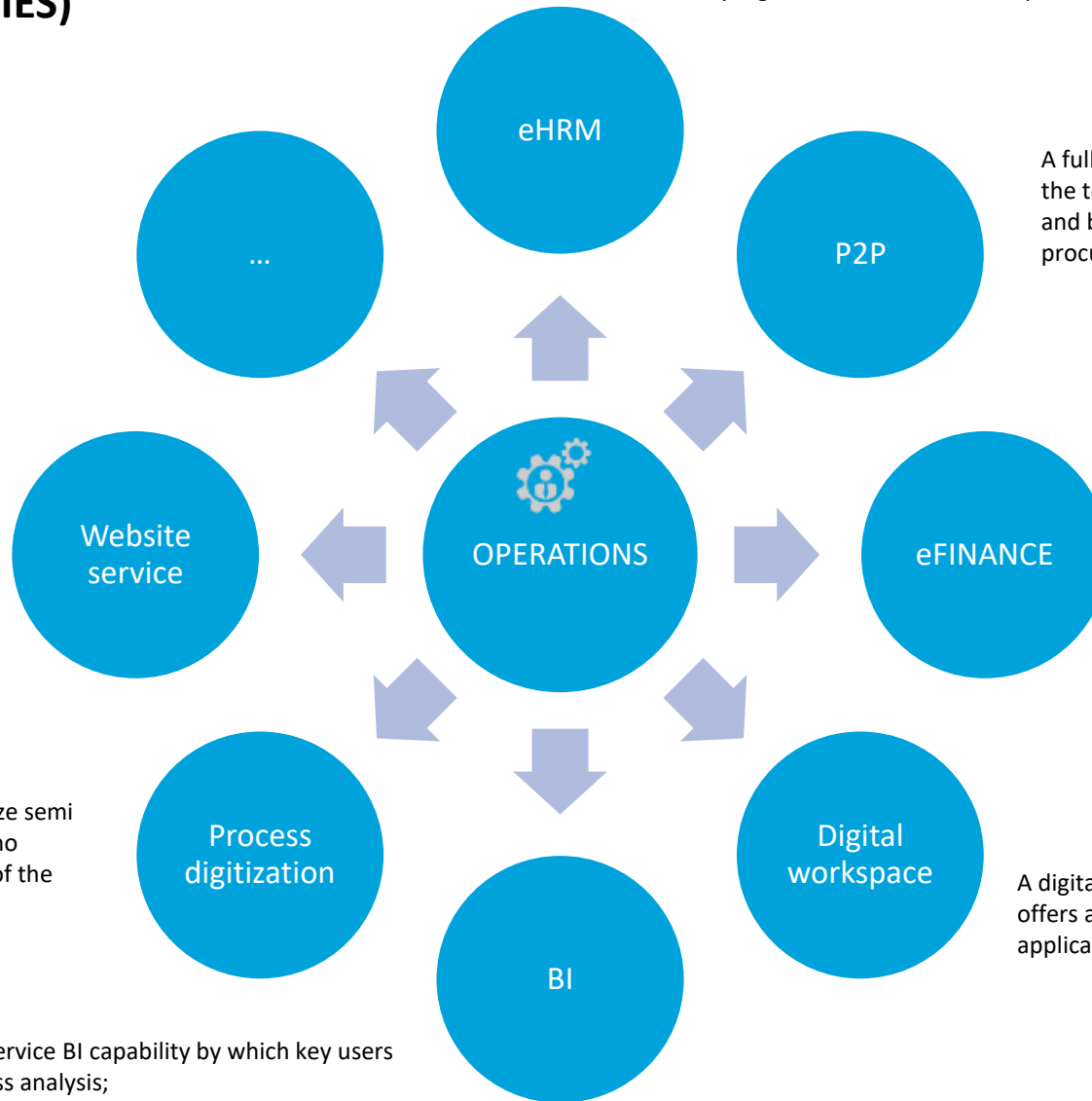
 **VALUE CREATION (POSSIBILITIES)**

....

The availability of a website service that can be used to easily create and manage websites for example for research projects or research departments;

The availability of a case management capability that can digitize semi structured, information intense, business processes for which no dedicated software is available and also handles the archiving of the information;

The availability of a self service BI capability by which key users can create ad hoc business analysis;



Fully digitized UM uniform HRM processes based on a market standard.

A fully digitized Purchase 2 Pay (P2P) process for at least the top 100 UM suppliers, that is e-Invoice compliant and based on a market best practice and online procurement platform;

PRIORITIZATION BY BUSINESS IS NEEDED !

Further automation of recurring financial processes to free up time that can be spend on financial data analysis aided by business intelligence technology.

A digital working environment with a great UM uniform UX that offers all the information and services that are generic and applicable for all UM employees.



5. What do we want to achieve in the I-domain ?



BE EFFICIENT

1. AGILE INFRASTRUCTURE, SOLUTIONS AND ORGANIZATION

We live in a Volatile, Uncertain, Complex and Ambiguous (VUCA) World. The only constant is change. Agility is the obvious answer to this. By being agile the organization can more easily and faster adapt to changing circumstances. Agility is needed within the IT infrastructure, the solutions that are being used and last but not least the (I) organization itself.

3. EASY, FAST AND ONLY AUTHORIZED ACCESS TO RESOURCES

People should have easy access to all the resources they are authorized for given a certain situation. It should also be clear what their authorizations are and why they have them. If the current access rights are not sufficient the UM community member must easily be able to remedy that. The UM resources must be well protected against unauthorized access.

5. ENERGY EFFICIENT IT (SUSTAINABILITY)

Sustainability is a major topic at the UM. In order for the UM to attain its sustainability goals the IT domain should also step up as it is a major energy consumer. When buying hardware or setting up a datacenter, the energy efficiency should be an important factor to weigh in.

2. FAST DELIVERY OF INNOVATION AND IMPROVEMENTS

The creation of new services and the improvements of existing services must be done in a timely manner. Currently innovation is slow and cumbersome due to a lack of resources, the wrong methods being used and rigid IT infra and solutions. The latter mainly because of the amount of custom code in it.

4. TRANSPARENCY OF SERVICE PERFORMANCE AND COSTS

It must be very clear to the UM community, what (IT) services are being offered by whom and what value they bring. The delivery conditions, the specification of the service and performance must be clear from the user point of view (in business terms). The cost structure and the amount of the services being used by the customer should also be clearly communicated. This also makes it easier to compare internal services with comparable external services.

6. ONE STOP SHOPPING FOR IT (RELATED) SERVICES

For the UM community it must be clear who is responsible for what so they know who they can turn to. This responsibility should span the whole service from the viewpoint of the consumer (UM community member) and not just a little part of it. The IT domain mustn't bother the consumer of the IT service with its own internal structure.



5. What do we want to achieve in the I-domain ?



PROTECT & COMPLY

1. SECURE BUSINESS CONTINUITY

More and more business processes are dependent on IT which is also getting more open. This brings a lot of benefits but also some vulnerabilities. If the IT doesn't work as it should business processes can get stuck and the business continuity is at risk. The IT domain should therefore secure the agreed upon service availability.

2. SECURE COMPLIANCY TO LAWS AND REGULATIONS

There are various laws and regulations the UM must abide to. The new GDPR, dealing with data privacy, is an important example of this. Another important example is the Archive Law which states what information must be archived for how long. The UM should have to proper processes and IT in place so it can demonstrable comply with these laws and regulations.

3. PROTECT DATA

Data is an important asset of the university. At the one hand you want to share it with the world (Open Science philosophy) but at the same time some data must be protected against the world. Therefore the proper security measures must be taken in accordance with the CIA classification of the data.



BEST PRACTICE BUSINESS PROCESS

The UM should adhere to the best practice business process for business processes that are non-differentiating.

RATIONALE: Adhering to the best practice business process represents the cheapest way of supporting business processes with IT because you can use standard software without the need for expensive modifications (custom code). By doing this you can also make optimal use of the innovation potential of the software vendor because all the new functionalities they create can easily be turned on (which is not the case if you have a lot of custom code). Adhering to the market standard also improves the connectivity which makes it easier to connect/integrate with external data, applications and parties. All this is also a pre-requisite for the UM to be able to make use of the services of cloud vendors. Since more and more software vendors are shifting to a cloud service model, the UM will more and more be forced to adopt a best practice business process.

IMPLICATIONS: Standard software (on premise or cloud) is build with a certain best practice business process in mind. For the UM to be able to use this software (without modifications) it should adjust it's own business processes to this best practice.



TRINITY OF STANDARDIZATION

Process, information and application standardization and decision-making power for a (group of) business capabilities must be organized at the same organizational level.

RATIONALE: If the business process and or the business information is standardized at a different organizational level as the application then tension will be created. Different versions of the same type of business process must then be supported with one and the same application. To handle this mismatch (one application versus multiple versions of the business process) custom code is created. Custom code is very expensive in the long run and decreases the agility of the IT services. It also makes it impossible for the UM to make use of all the new developments created by the software vendor. Instead of using the innovative potential of the software vendor the UM can then only rely on it's own innovation power by creating even more custom code. This creates a downward spiral.

IMPLICATIONS: If the business processes for a certain business capability should or must differ between organizational units then the application can no longer be a concern information system. The units will then be responsible for delivering, maintaining, developing and paying for their own application.



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Specification what is meant with big data infrastructure

Big data infrastructure

An infrastructure that enables the handling of big data. This infrastructure consists of

- (1) sufficient data storage capacity for both big data sets and all the other research data sets
- (2) sufficient network bandwidth (within the UM and to the outside world)
- (3) data transfer facilities (within the UM and with external partners)
- (4) a Research Data Management platform
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Question : Must the UM also facilitate its own High Performance Computing (HPC) facility or will the UM use HPC facilities from other institutions ?

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OVERVIEW I-AGENDA RATIONALE

I-AGENDA THEMES PER DOMAIN		VALUE CREATION	BE EFFICIENT (I-DOMAIN)	PROTECT & COMPLY
EDUCATION	DIGITAL UX	X		
	FLEXIBILITY & ADAPTIVE LEARNING	X		
	PREPARE EDUCATION	X		
	LIFE LONG LEARNING	X		
	OPEN SCIENCE	X		
RESEARCH	OPEN RESEARCH WORKSPACE	X		
	SUPPORT RESEARCH SERVICES	X		
	DELIVER RESEARCH SERVICES	X		
	DIGITAL WOKPLACE	X		
OPERATIONS	HOLISTIC E-OPERATIONS	X		
	PROCESS DIGITIZATION	X		
	...	X		
	RAPID APPLICATION DEVELOPMENT		X	
TECHNOLOGY	CONNECTIVE TISSUE		X	
	HOLISTIC IT4IT		X	X
	RENEW INFRA	X	X	X
	REFOCUS IT	X	X	X
OVERALL	PROTECT & COMPLY			X
	ANALYTICS	X		



I-AGENDA EDUCATION

THEME: ...

GOAL DESCRIPTION

POSSIBLE EXAMPLE PROJECTS

CONTRIBUTES TO BUSINESS DEMAND TOWARDS IT DOMAIN

VALUE CREATION BE EFFICIENT PROTECT & COMPLY

RATIONALE

THIS IS AN EXAMPLE FORMAT THAT
DETAILS THE GOAL AND RATIONALE
BEHIND EACH THEME.