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Research Program
“Digital Business & Transformation IWI-HSG”

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Abstract

The digitization of society is changing the way we work, live, communicate, interact, as well as how and when we consume and produce products and services.

The transformation of the information society into the digital society creates a new wave of business start-ups (Figure 1). Within this context, it is up to each individual to recognize and seize opportunities, namely each innovative entrepreneur founding a new business, as well as decision makers intending to restructure their companies. The research and education at IWI-HSG aims at supporting these projects.

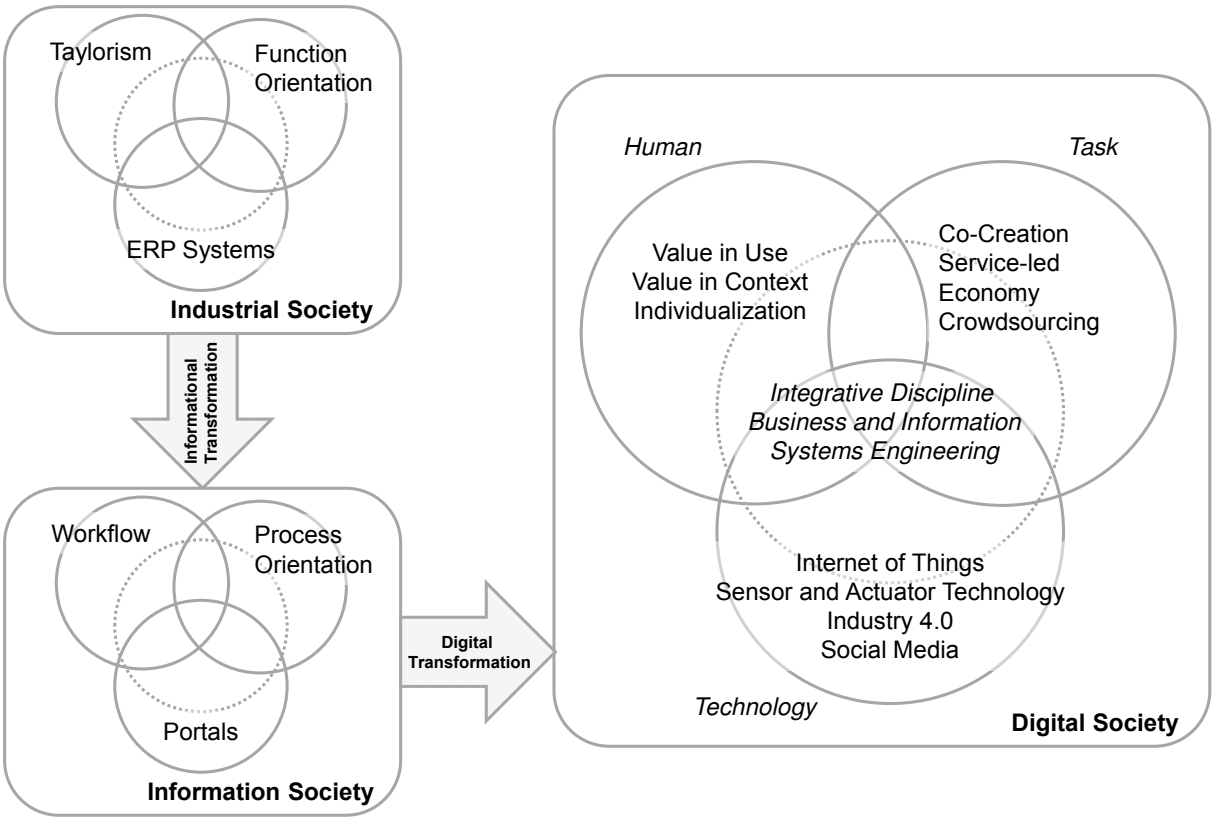

Figure 1: Waves of Business Start-ups

The digital society creates multiple new challenges for companies. Catchwords such as *Industry 4.0*, *Service-led Economy*, and *Co-creation* are often mentioned in this context. On the user side, the ever-increasing demand for customized services exactly providing the desired value in the desired quality at the right time can be observed.

In many areas the trend is no longer to sell the products itself but their benefits and consequently to (re-)design the business, services and operating models. This inevitably leads to the creation of new digital benefits for the customer which already are or will become crucial for sustainable market success.

In addition, the well-known prior challenges remain. Business processes and their optimization will not become less important in the digital society. Rather, the old challenges will be supplemented by additional digital transformation challenges. In the digital society, it will be therefore of utmost importance for businesses to both optimize their internal processes as well as to understand the digital users in order to be successful on the market. It is important to note that users of the digital age comprise of both own employees (internal digital users) as well as any type of customer (external digital users).

The field of Business and Information Systems Engineering has always considered itself as an integrative discipline between business and IT. This integration task is becoming more and more important since IT increasingly influences people’s everyday lives and focuses on the digital users’ needs.

The research program *Digital Business & Transformation IWI-HSG* intends to organize the cooperation between industry and the IWI-HSG, tackle important business problems, as well as develop solutions, process them in an academic context, and implement them in pilot projects in companies.

The research program *Digital Business & Transformation IWI-HSG* supports companies in the transformation process from the information society to the digital society.

The research program enables efficient and motivating work without extensive research bureaucracy. In cooperation projects between IWI-HSG and its industrial partners, we strive to learn from each other and to create new knowledge, which is valuable both for research at the IWI-HSG as well as our industrial partners.

Key words: Research Program, Digital Business & Transformation, Digital Business & Transformation IWI-HSG, St. Galler House of Digital Business

Table of Contents

1 The Challenge of Digitization

The digitization of society is changing the way we work, live, communicate, interact, as well as how and when we consume and produce products and services.

The ever-increasing number of mobile devices and their interconnectedness are the main drivers of digitization. The digital users are therefore almost constantly online and expect that they can use their digital products and services anytime, anywhere. The introduction of new standards such as IPv6 also opens up new networking opportunities, and clearly suggests that the digitization of society has only just begun.

As of today, a change in the digital users’ expectations as well as five trends can be observed, some of which might cause disruptive changes in businesses. Therefore, decision makers have to identify the user-specific changes in order to initiate the required organizational changes (Figure 2).

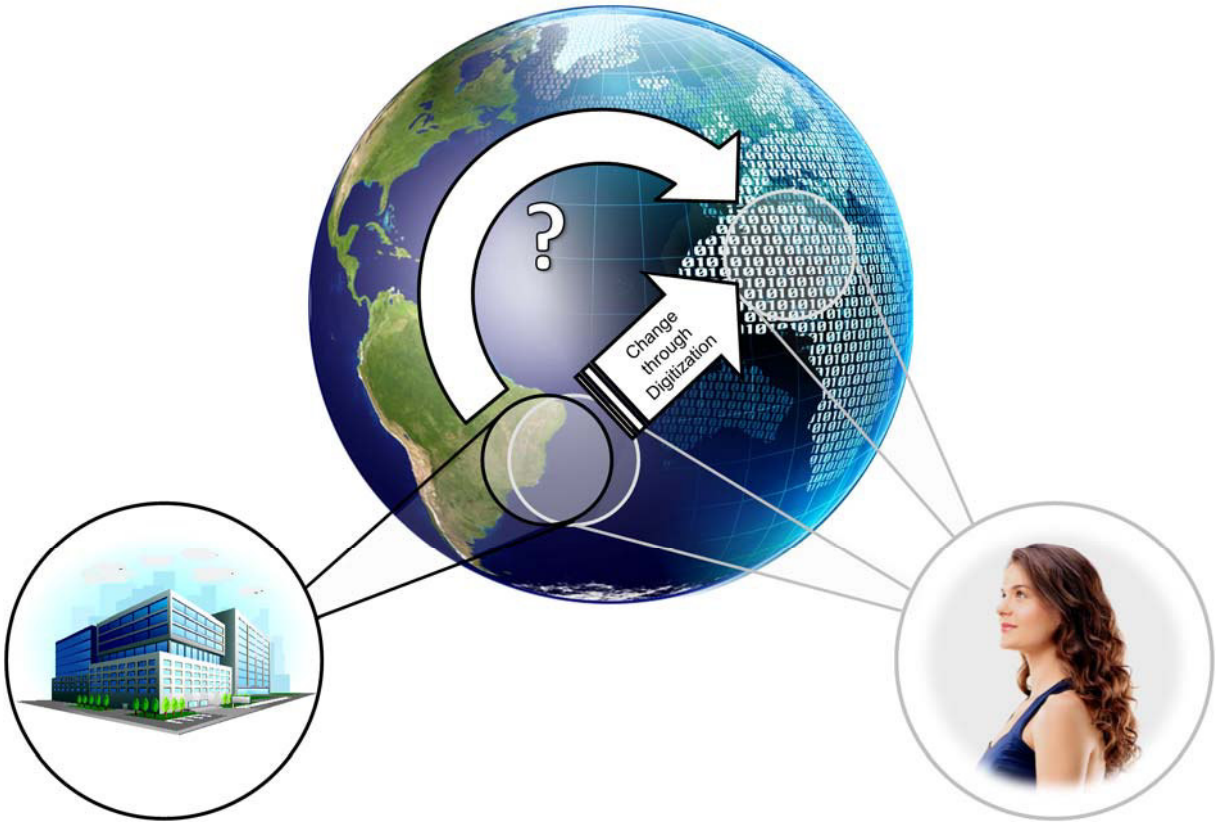

Figure 2: Companies need to adapt to the changed expectations of the digital users

1.1 Five Major Trends

Digitization of products and services. Products and services are increasingly being enriched with digital value-added services, or are even completely digitized. Thereby, innovative opportunities for value creation and product-service-combinations arise for companies affecting their entire portfolio, and the development of new, as well as the management of existing products and services. Furthermore, the value for the digital user, which is created by the use of a product or service, is becoming increasingly important. Here, the variety of the different preferences of different users must be taken into account, and, following the idea of mass customization, products and services that adapt to different users should be offered.

Context-sensitive value generation. Due to the still increasing popularity of mobile devices and the mobile Internet, digital users are almost always online and expect customized solutions, and support according to their current situation. For example, they want to access all important information in the familiar way, on the go as well as at home, and expect, e.g., that recommendations take their current location into account. Taking into account the current context of the users represents a new dimension of user value in the digital age outlined above. Through technical developments in the areas of sensor and actuator technology, it is basically possible to generate the necessary data and initiate the necessary changes. However, the major challenge of Big Data is the derivation of the necessary changes based on the mass of data. The better a company will be able to solve the challenge and coordinate their services to meet the users’ needs, the greater the likelihood of succeeding on the market.

Consumerization of organizational IT. Nowadays, the majority of IT innovations is developed for the consumer market. In a first step, this changes the users’ private lives. In a second step, businesses often face the desire of employees, to integrate the innovations they already use extensively in their private lives into their work environment. This results in a multitude of challenges for businesses, for example the safe integration of different mobile devices into the IT architecture of a company, and the adaptation of business applications in line with this heterogeneity.

Digitization of work. Digitization also greatly influences how we work. Nowadays, it is for example much easier to work together despite large distances. Furthermore, trends such as crowdsourcing allow an uncomplicated and often resource-friendly outsourcing of business tasks. In this context, businesses find themselves confronted with the issues of productive leadership and coordination of employees from different continents, as well as the optimal definition of tasks enabling crowdsourcees to complete these in the desired quality.

Digitization of business models. In the course of digitization, businesses need to adapt or even redevelop their business models. In this context, companies often stress the challenges and negative sides of this development. However, digitization offers opportunities to conquer new markets or market shares by means of innovative business models. Internet businesses such as Amazon or eBay for example, compete with businesses with decades of experience by means of cloud computing or financial service offerings. Businesses today face two different challenges. On the one hand, they need to adapt their business models to digitization. On the other hand, they need to develop new innovative business models based on their current skills and competencies.

1.2 The IWI-HSG Solution – Digital Business & Transformation Following the Principles: User-, Use-, Utility-Centricity

While most business and management sciences focus on the management and optimization of businesses, the research programs of the IWI-HSG has focused for many years on the development and transfer of knowledge in order to implement new trends into business solutions, namely the transformation of businesses within the entire business-to-IT stack. The new research program *Digital Business & Transformation IWI-HSG (DBT IWI-HSG)* is being built upon existing strengths and follows the principles of *user-, use-, utility-centricity*, which puts the digital users together with their needs center stage, in order to overcome future challenges.

Innovative entrepreneurs and decision makers in the industry seeking the assistance in mastering the challenges of digitization define the *DBT IWI-HSG* target group, in particular chief information officers, chief digitization officers, or executives responsible for transformation programs.

2 Research Program “Digital Business & Transformation IWI-HSG”

In projects or competence centers, more than 40 renowned industrial partners cooperate with the research team, developing innovative business solutions and methods of business transformation. The IWI-HSG has already completed a number of different cooperations resulting in the successful implementation of the results within several companies (see section 4).

2.1 From Business Engineering to Digital Business & Transformation

The IWI-HSG and its industrial partners have maintained a successful cooperation in the framework of the research program *Business Engineering HSG* for 15 years now. The strength of the Business Engineering (BE) program lies in the (re)engineering of business solutions within the entire business-to-IT stack. The new research program DBT IWI-HSG deliberately builds on this strength of the previous program and aims in addition to engineer products and services based on the needs of the digital users. This ensures a successful adaptation to the new conditions of the digital age.

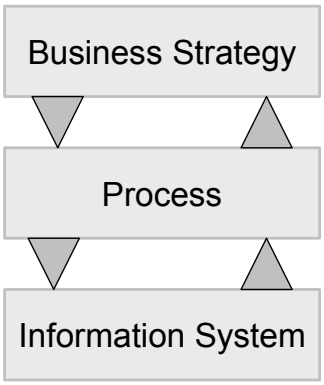

Figure 3: Traditional Business Engineering Model

A comparison of the two figures shows that the traditional BE model (see Figure 3) serves as the core of the *St. Galler House of Digital Business* (see Figure 4). This core is supplemented by the columns managerial functions, and an outcome perspective – products and services. In addition, the user-, use-, utility-centricity resembles the roof of the house, and data serves as a glue joining all parts. Furthermore a lifecycle perspective is introduced. The first extension is

necessary because the digitization increasingly influences how we work. Consequently, executives need to perform additional management tasks, some of which require new skills. Thus, it will become even more important to ensure the effective use of information systems and to counteract barriers on the employees’ side. Due to the ever-increasing use of IT. The emphasis on the outcome perspective represented by a separate column is required because IT more often becomes an essential part of the provided products or services. Furthermore an increase of servitization can be observed, i.e. a shift from offering solutions, product-service-systems and services (e.g., as-a-service offers) instead of products. Therefore, the outcome perspective deals with questions concerning the design of these solutions as a combination of products, IT and services taking into account the increasing interaction between suppliers and customers as well as the value of these outcomes in the process of use. This view is closely intertwined with the lifecycle perspective. The digitization causes an acceleration in the innovation cycles and influences all views. Therefore, issues around a consistent and systematic development of new service offerings and their management over the entire lifecycle are essential. The user-, use-, utility-centricity as the roof expresses that the DBT IWI-HSG centers on the digital users and their needs. The digital users, both internal and external, expect personalized products and services customized to their needs and current situation. Therefore, specific business solutions need to be developed, namely solutions that address digital users’ needs and consider economic considerations in order to generate the greatest benefit possible for all stakeholders. Data accounts for the increasing importance of Big Data for companies. Leading companies such as Google and Amazon have mastered drawing conclusions about needs and future behavior of the customers based on existing data. These conclusions then, for example, serve as an input for the development of new products and services, the definition new business strategies and processes

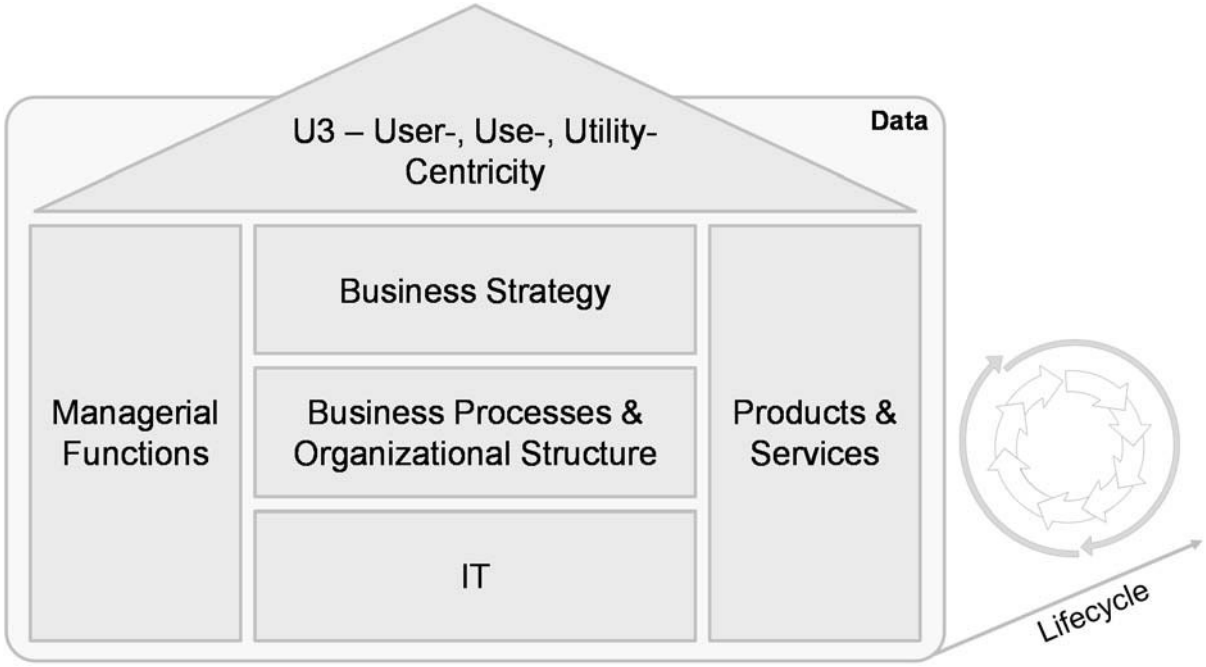

Figure 4: St. Galler House of Digital Business

2.2 IWI-HSG Research Areas

The IWI-HSG focuses its research on nine core issues:

- Architectural Thinking
- Business Model and IT Innovations, Digital Value Creation
- Change Management
- Crowdsourcing & Digital Work
- Information Logistics Management
- IT, Strategic and Operational Leadership
- Organizational Design and Engineering
- Service Engineering, Management, and Innovation
- Use of IT for the Development, Preservation and Management of Skills

3 Objectives and Tasks of the Research Program

The basic idea of the research program DBT IWI-HSG is to build on the knowledge base of the BE program as well as to generate and bundle additional know-how in St. Gallen. The research program is intended to structure the activities of the IWI-HSG in the field of Digital Business & Transformation. It

equally aims for scientific excellence according to the criteria of the international scientific community, and for practical relevance, so that businesses are willing to cooperate with the IWI-HSG and invest own resources in joint research activities.

3.1 Objectives

The core objective of the DBT IWI-HSG program is to develop strategies, concepts, methods, and specific solutions for mastering the challenges of digitization. The IWI-HSG therefore strives to assist businesses with their digital transformation.

The DBT IWI-HSG program combines the forces of major businesses from different industries and countries with the potential of a university research institute. The program focuses on selected areas of Digital Business & Transformation and intends to:

- combine the resources of the involved businesses and the IWI-HSG,
- establish long-term cooperations,
- support timely pilot implementations of project results,
- stimulate the innovative application of IT,
- help to communicate essential findings and issues to the general public,
- support its industrial partners in leveraging the economic potential of the digitization, and
- ensure a practice-oriented education at the University of St. Gallen.

3.2 Tasks

The following main tasks of the DBT IWI-HSG are defined in order to achieve the described objectives:

- Formulation of the IWI-HSG research strategy.
- Ensuring continuity in research.
- Generating access to practical challenges.
- Acquisition of industrial partners for research cooperations.

- Integration of current scientific findings into the education of students and executives.
- Recruiting of Digital Business & Transformation experts.
- Easy access to personified know-how.
- Evaluation of research results in different areas of Digital Business & Transformation (e.g., methods, prototypes).
- Building and maintaining an international personal network.

4 Results of the Research Program

Throughout past decades, several valuable results could already be generated in the course of the previous two research programs Information Management HSG and Business Engineering HSG. The new research program builds on those results and aims at generating the following types of results in the previously outlined areas (Figure 5):

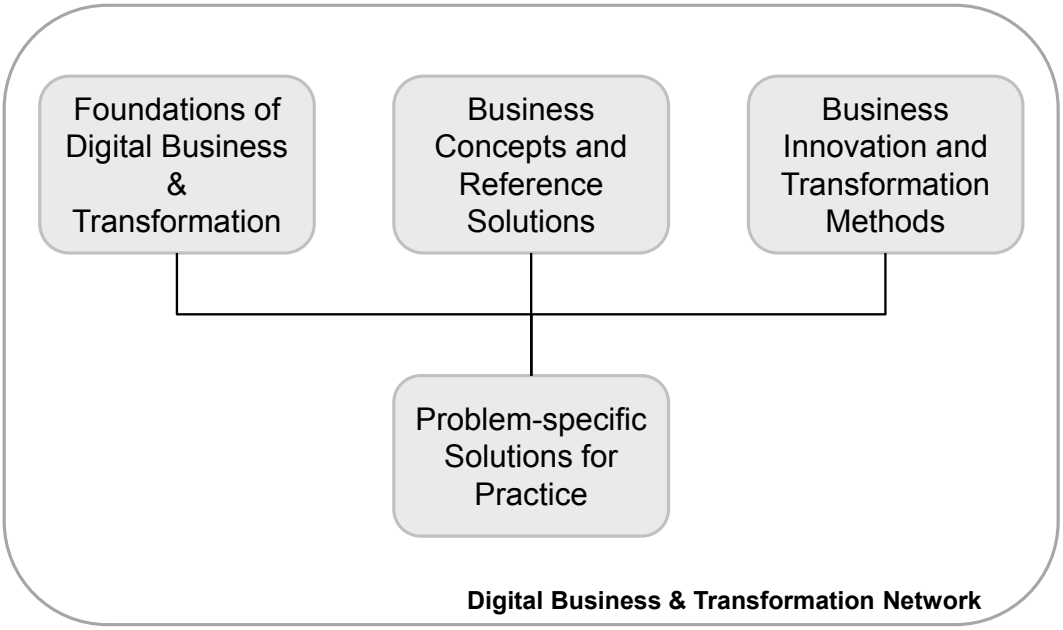

Figure 5: Results of DBT IWI-HSG

Foundations of Digital Business & Transformation. The IWI-HSG observes the trend towards a digital society. Based on this observation, it derives theories that help to understand this trend and predict changes for the economy and society. Based on these findings, we derive approaches for the design of innovative business solutions.

Business concepts and reference solutions. The IWI-HSG develops innovative IT-driven business solutions based on literature, knowledge data bases of consulting businesses, and its own inquires. Supported by insights from theory, the IWI-HSG derives reference solutions and business concepts.

Business innovation and transformation methods. In addition to the business concepts and reference solutions, the IWI-HSG investigates methods for successful innovation and transformation of businesses. It develops practical methods for i.e. project and change management, according to the guidelines of method engineering.

Problem-specific solutions for practice. In addition to the generation of generalizable scientific findings, the IWI-HSG also develops problem-specific practical solutions based on the existing knowledge base. This is usually carried out in cooperation with one or more partners within the framework of cooperation projects (see section 5.3 for more details).

Digital Business & Transformation Network. The IWI-HSG disseminates its research results in a Digital Business & Transformation Network. The industrial partners thus have the chance to learn from the experiences of the IWI-HSG and other partners. The goal is a continuous knowledge process with participating practitioners, researchers, and students.

Exemplary results of completed cooperations. The IWI-HSG can look back on a series of results from previously completed cooperations. Examples are:

- Executive MBA in Business Engineering (approx. 45 graduates per year since 1998), alumni networks of PhDs and master degree graduates.
- Spin-offs: e.g., IMG, Namics AG (former Delta Group), Commtrain, Information Factory.
- Numerous successful cooperations with industrial partners.
- Book series Business Engineering with more than 25 volumes, a variety of journal articles, talks, videos, events, learning materials, and media reports.

5 Organization of the Research Program

The organizational structure of the research program DBT IWI-HSG is as follows (Figure 6):

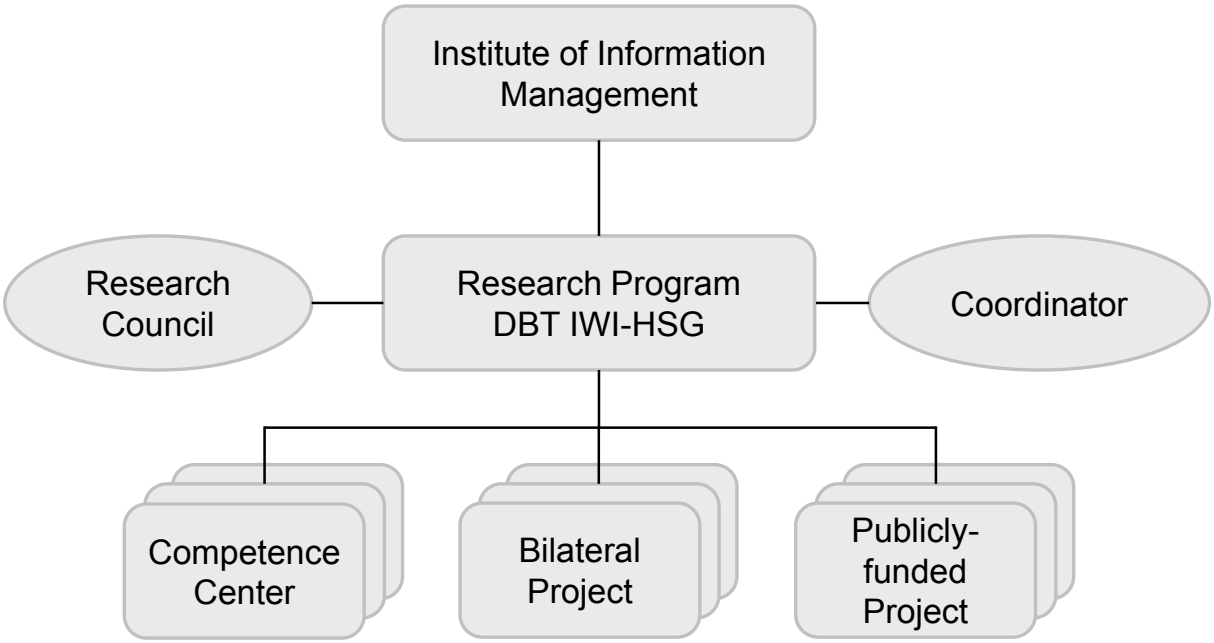

Figure 6: Organizational Structure of DBT IWI-HSG

5.1 Research Council (the Forschungsrat)

The research council of the IWI-HSG consists of a number of senior executives of selected industrial partners and has the following tasks:

- The research council suggests new research areas and evaluates the practical relevance of planned research projects.
- The members of the research council show their commitment to the DBT IWI-HSG by personally attending the regularly scheduled research council meetings.
- The members of the research council encourage their companies to cooperate with the IWI-HSG according to the cooperation possibilities (see section5.3 for a more detailed description).
- The members of the research council promote the popularity of the DBT IWI-HSG and the IWI-HSG within their personal networks.

- The members of the research council support the research and education at the University of St. Gallen in the field of Digital Business & Transformation with an annual monetary contribution.

5.2 Research Program Coordinator

The research program DBT IWI-HSG is coordinated by an IWI-HSG professor. The coordinator’s tasks are the following.

- Organization of research council meetings.
- Promotion of publications from cooperations.
- Public relations.
- IWI research coordination according to the guidelines of the research program.
- Budget and financial statements.
- Organization and operation of the Digital Business & Transformation network.

5.3 Cooperation Opportunities

Competence Centers (CCs) are the established consortial research model at the IWI-HSG. A CC unites academic staff and experts from the industrial partners in one workgroup under the scientific supervision of a professor. The work of the academic staff is financed by the contributions of the partner businesses. An advisory board supports the CC director by adopting or revising a proposed project plan. Furthermore, the board monitors the progress of the project, the use of funds, as well as the work content.

Bilateral projects. Compared to CCs, bilateral projects have the advantage that a specific project may be carried out faster and in a less bureaucratic way. Here, usually one professor and one industrial partner cooperate directly. The industrial partner finances the effort of the academic staff working on the project. The past has shown that new cooperations often begin with bilateral projects, and are then brought to the next level in the form of CCs.

Publicly-funded projects. From the perspective of the IWI-HSG, publicly-funded projects have the advantage that often a comparatively long-term financing is secured. EU projects, e.g., are usually set up for three years and have a chance to be extended. For companies, such projects offer the opportunity of gaining access to latest research results with a comparatively small effort. Companies have several options for cooperating. On the one hand, a company can become a direct project partner, meaning that the company receives a direct subsidy and in exchange leads and completes work packages within the project. On the other hand, a company can participate as a value partner. In this case, the company contributes to the evaluation of the project results without having to lead or complete own work packages. The specific form of cooperation very much depends on each individual case.