University of St.Gallen

Course and Examination Fact Sheet: Autumn Semester 2022

7,810: Emerging Business Models in Digital Health

ECTS credits: 3

Overview examination/s

(binding regulations see below)
Decentral - examination paper written at home (individual) (15%)
Examination time: term time
Decentral - Presentation (in groups - all given the same grades) (85%)
Examination time: term time

Attached courses

Timetable -- Language -- Lecturer
7,810,1.00 Emerging Business Models in Digital Health -- Englisch -- Kowatsch Tobias

Course information

Course prerequisites

Interest in the multi-disciplinary field of **Digital Health** at the intersection of **health economics**, **business informatics**, **computer science**, and **behavioral medicine**.

Learning objectives

After the course, students ...

1. know what a business model in digital health is
2. can explain the elements of a business model in digital health
3. understand specific aspects of business models in private/public health care systems
4. can identify top-funded companies providing digital health services
5. can systematically assess the business models of companies providing digital health services

Course content

Q1 2022 Digital Health Funding Reaches $6B Across 183 Deals (Rock Health, 2022), **The promise of the metaverse in cardiovascular health** (European Heart Journal, 2022), **Can Virtual Reality Help Ease Chronic Pain?** (The New York Times Magazine, 2022), **First of its Kind Alexa Experience Provides Hands-Free Access at Home to General Medical Care** (GlobeNewswire, 2022), **Can digital technologies improve health?** (The Lancet, 2021), **Predictive analytics and tailored interventions improve clinical outcomes** (npj Digital Medicine, 2021)

What are the business models behind the recent developments in the field of digital health?

In the 20th century, healthcare systems specialized in acute care. In the 21st century, we now face the challenge of dealing with the specific characteristics of non-communicable diseases (NCDs) including common mental disorders. NCDs are now responsible for around 70% of all deaths worldwide and 85% of all deaths in Europe and are associated with an estimated economic loss of $7 trillion between 2011 and 2025. Chronic and mental diseases are characterized in particular by the fact that they require an intervention paradigm that focuses on prevention and lifestyle change. Lifestyle (e.g., diet, physical activity, tobacco, or alcohol consumption) can reduce the risk of suffering from a chronic condition or, if already present, can reduce its burden. A corresponding change in lifestyle is, however, only implemented by a fraction of those affected, partly because of missing or inadequate interventions or health literacy, and partly due to socio-cultural influences. Individual personal coaching of these individuals is neither scalable nor financially sustainable.

To this end, the question arises of how the business models of companies look like that offer digital health services that address these challenges. Digital health services rely on information and communication technologies (e.g. smartphones, wearables, digital biomarkers, conversational agents, voice assistants, artificial intelligence) for the prevention and treatment of diseases in our everyday lives. They also allow medical doctors and other caregivers to scale and tailor long-term treatments to individuals in need. At the intersection of health economics, behavioral medicine, business informatics, and computer science, this lecture has the objective to help students and upcoming healthcare executives interested in the multi-disciplinary field of digital health to understand better business models of top-funded companies that offer digital health services.

The following topics are covered in this lecture to reach the learning objectives:

1. Introduction to business models in digital health
2. Specifics of business models in digital health
3. Identification of top-funded digital health companies
4. Systematic assessment of the business models of digital health companies

Course structure and indications of the learning and teaching design

The lecture is structured in two parts. In the first part, students will learn key aspects of business models in digital health. Complementary learning material (e.g., video clips), multiple-choice questions, and exercises are provided online via Canvas.

In the second part, students work in teams and will critically assess the business models of top-funded companies that offer digital health services. Each team will then present and discuss the findings of the assessment with their fellow students. Additional coaching sessions are offered to support the teams with the preparation of their presentations.

Course literature

Cohen, A. B., Dorsey, E. R., Mathews, S. C., Bates, D. W., & Safavi, K. (2020). A digital health industry cohort across the health continuum. Nature Digital Medicine, 3(68). https://doi.org/10.1038/s41746-020-0276-9

Collins, L. M. (2018). Optimization of Behavioral, Biobehavioral, and Biomedical Interventions: The Multiphase Optimization Strategy (MOST). Springer.

Essén, A., Stern, A. D., Haase, C. B., Car, J., Greaves, F., Paparova, D., Vandeput, S., Wehrens, R., & Bates, D. W. (2022). Health app policy: international comparison of nine countries' approaches. npj Digital Medicine, 5(1), 31. https://doi.org/10.1038/s41746-022-00573-1

Gassmann, O., Frankenberger, K., & Choudury, M. (2020). The Business Model Navigator. Pearson Education, Limited.

Grichnik, D., Hess, M., Probst, D., Antretter, T., & Pukall, B. (2020). Startup navigator : guiding your entrepreneurial journey. Red Globe Press.

Jacobson, N., Kowatsch, T., & Marsch, L. (Eds.). (2022). Digital Therapeutics for Mental Health and Addiction: The State of the Science and Vision for the Future (1st ed.). Elsevier, Academic Press.

Keller, R., Hartmann, S., Teepe, G. W., Lohse, K.-M., Alattas, A., Tudor Car, L., Muller-Riemenschneider, F., von Wangenheim, F., Mair, J. L., & Kowatsch, T. (2022). Digital Behavior Change Interventions for the Prevention and Management of Type 2 Diabetes: Systematic Market Analysis. J Med Internet Res, 24(1), e33348. https://doi.org/10.2196/33348

Kelley, L. T., Fujioka, J., Liang, K., Cooper, M., Jamieson, T., & Desveaux, L. (2020). Barriers to Creating Scalable Business Models for Digital Health Innovation in Public Systems: Qualitative Case Study. JMIR Public Health Surveill, 6(4), e20579. https://doi.org/10.2196/20579

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Mathews, S. C., McShea, M. J., Hanley, C. L., Ravitz, A., Labrique, A. B., & Cohen, A. B. (2019). Digital health: a path to validation. npj Digital Medicine, 2(1), 38. https://doi.org/10.1038/s41746-019-0111-3

Mesko, B. (2022). The promise of the metaverse in cardiovascular health. European Heart Journal, ehac231. https://doi.org/10.1093/eurheartj/ehac231

Safavi, K., Mathews, S. C., Bates, D. W., Dorsey, E. R., & Cohen, A. B. (2019). Top-Funded Digital Health Companies And Their

Impact On High-Burden, High-Cost Conditions. Health Affairs, 38(1), 115-123.

Schlieter, H., Marsch, L. A., Whitehouse, D., Otto, L., Londral, A. R., Teepe, G. W., Benedict, M., Ollier, J., Ulmer, T., Gasser, N., Ultsch, S., Wollschlaeger, B., & Kowatsch, T. (2022). Scale-up of Digital Innovations in Health Care: Expert Commentary on Enablers and Barriers. J Med Internet Res, 24(3), e24582. https://doi.org/10.2196/24582

Stephanie, L., & Sharma, R. S. (2020). Digital health eco-systems: An epochal review of practice-oriented research. International Journal of Information Management, 53, 102032. https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2019.10.017

Steinberg, D., Horwitz, G., & Zohar, D. (2015). Building a business model in digital medicine. Nature Biotechnology, 33(9), 910-920. https://doi.org/10.1038/nbt.3339

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Teepe, G. W., Da Fonseca, A., Kleim, B., Jacobson, N. C., Salamanca Sanabria, A., Tudor Car, L., Fleisch, E., & Kowatsch, T. (2021). Just-in-Time Adaptive Mechanisms of Popular Mobile Apps for Individuals With Depression: Systematic App Search and Literature Review. J Med Internet Res, 23(9), e29412. https://doi.org/10.2196/29412

Additional course information

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Examination information

Examination sub part/s

1. Examination sub part (1/2)

Examination time and form
Decentral - examination paper written at home (individual) (15%)
Examination time: term time

Remark
Online exercises via online learning platform

Examination-aid rule
Term papers

Written work must be written without outside help according to the known citation standards, and a declaration of authorship must be attached, which is available as a template on the StudentWeb.

Documentation (quotations, bibliography, etc.) must be carried out universally and consistently according to the requirements of the chosen/specified citation standard such as e.g. APA or MLA.

The legal standard is recommended for legal work (cf. by way of example: FORSTMOSER, P., OGOREK R., SCHINDLER B., Juristisches Arbeiten: Eine Anleitung für Studierende (the latest edition in each case), or according to the recommendations of the Law School).

The reference sources of information (paraphrases, quotations, etc.) that has been taken over literally or in the sense of the original text must be integrated into the text in accordance with the requirements of the citation standard used. Informative and bibliographical notes must be included as footnotes (recommendations and standards e.g. in METZGER, C., Lern- und Arbeitsstrategien (latest edition)).

For all written work at the University of St.Gallen, the indication of page numbers is mandatory, regardless of the standard chosen. Where page numbers are missing in sources, the precise designation must be made differently: chapter or section title, section number, article, etc.

Supplementary aids

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Examination languages
Question language: English
Answer language: English

2. Examination sub part (2/2)

Examination time and form
Decentral - Presentation (in groups - all given the same grades) (85%)
Examination time: term time

Remark
Presentation of team project

Examination-aid rule
Presentations
In presentations, aids for visual presentation can be used. These aids can be specified or restricted by the lecturers.

Supplementary aids

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Examination languages
Question language: English
Answer language: English

Examination content

1. Introduction to business models in digital health
2. Specifics of business models in digital health
3. Identification of top-funded digital health companies
4. Systematic assessment of the business models of digital health companies

Examination relevant literature

Mandatory Material

The mandatory material will be provided via the online learning platform no later than November 11, 2022.

University of St.Gallen

Please note

Please note that only this fact sheet and the examination schedule published at the time of bidding are binding and takes precedence over other information, such as information on StudyNet (Canvas), on lecturers' websites and information in lectures etc.

Any references and links to third-party content within the fact sheet are only of a supplementary, informative nature and lie outside the area of responsibility of the University of St.Gallen.

Documents and materials are only relevant for central examinations if they are available by the end of the lecture period (CW51) at the latest. In the case of centrally organised mid-term examinations, the documents and materials up to CW 42 are relevant for testing.

Binding nature of the fact sheets:

- Course information as well as examination date (organised centrally/decentrally) and form of examination: from bidding start in CW 34 (Thursday, 25 August 2022);
- Examination information (regulations on aids, examination contents, examination literature) for decentralised examinations: in CW 42 (Monday, 17 October 2022);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised mid-term examinations: in CW 42 (Monday, 17 October 2022);
- Examination information (regulations on aids, examination contents, examination literature) for centrally organised examinations: two weeks before the end of the registration period in CW 45 (Monday, 7 November 2022).