COURSE MANUAL

Data-Driven Business Creation (JBE150-B-5)

2024-2025 Q2

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General course information

Instruction language	English
Types of instruction	Lectures, tutorials and interactive guest lectures
Types of exams	Lean Canvas (20%), pitch (20%) and written exam (60%)
Types of resit exams	Resit exam (60%)
Level	Bachelor
Course load	5 ECTS credits
Registration	Osiris
Lecturers	Nina Delcaro[1]
	Werner Liebregts[2]
	Doron Zilbershtein

Learning objectives

On successful completion of this course, you are able to:

- Understand academic research that is relevant for the first phases of a business creation process, and translate this knowledge into evidence-based actions
- Identify and evaluate entrepreneurial opportunities that may become solutions to real-life problems of individuals and/or organizations
- Examine the market potential of a data-driven business idea by means of experimentation and validated learning
- Think critically about the steps to be taken on an entrepreneurial journey, and justify any decision made while creating a new data-driven business
- Clarify and defend a business idea during a pitch in front of a group of potential investors

Course description

Globalization and fast-paced technological development have changed – and still change – the way in which business opportunities are explored and exploited. It is easier than ever before for startups to scale globally and to challenge incumbent organizations that used to dominate industries over the past decades. Think of platform companies like Airbnb and Uber that are part of the sharing economy and completely disrupted the hotel and taxi service industries, respectively. At the same time, nascent entrepreneurs generally face quite some challenges. Think of regulatory barriers and a lack of access to the necessary financial resources.

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[2] Course coordinator. E-mail address: W.J.Liebregts@tilburguniversity.edu.

In the context of this course, you will go through the first phases of a typical process to create a data-driven business, either inside or outside an established organization. The setup of the course is therefore split up into four blocks, viz. (1) opportunity discovery, (2) customer development, (3) product development, and (4) pitching. First, you will generate your own business ideas tackling real-life problems that potential customers face, after which you select the most promising one. Second, you will engage in a process of customer discovery, validation and creation. Third, you will try to develop your product or service until it reaches the status of Minimum Viable Product (MVP), and experiment whether it has any market potential. Finally, during a pitch, you will have to convince several judges about the (future) value of your budding business.

Given that this is a compulsory course in the bachelor's program on Data Science, we expect you to exploit your extensive data science knowledge when developing your business idea. That is, your solution to an identified problem must be AI-, data- and/or technology-driven in one way or another. Although some of you may not see yourself becoming an entrepreneur, we challenge you to consider this course as a unique opportunity to find out whether entrepreneurial behavior fits your personality and future career plans. Anyway, in case you opt for a paid job at an already established organization instead, an entrepreneurial mindset and related skills are also considered very valuable by employers nowadays.

During your entrepreneurial activities for this course, you are encouraged to make use of state-of-the-art scientific knowledge. Part of the academic research is covered in the weekly lectures, but you are also strongly encouraged to search for academic research yourselves to substantiate your decisions. A written exam at the end of the course will test your level of knowledge about the compulsory reading material. The course also aims to develop important professional skills to a greater or lesser extent. Most emphasis in this course is placed on academic reasoning, pitching, reflecting, and teamwork.

Compulsory reading material

- Academic journal articles (also see *Reading material*)
- Lecture slides
- Tutorial slides

Supplementary reading material

- Academic journal articles (also see *Reading material*)

Professional skills

- Academic reasoning
- Pitching
- Reflecting
- Teamwork

Course schedule

	Week	Date	Activities	Lecturers and guests	Reading material
Introduction	1	Nov 13	**Lecture 1** – Introduction to the course [ONLINE VIDEO], introduction to the lean startup framework and method and discussion of course expectations and activities	Werner Liebregts Doron Zilbershtein	● Blank (2013)* ● Camuffo et al. (2020)** ● Felin et al. (2020)** ● Shepherd & Gruber (2021)*
		Nov 15	**Tutorial 1** – Team formation and preliminary identification of market opportunities based on your team's core abilities and technological elements	Doron Zilbershtein	
Opportunity Discovery	2	Nov 20	**Lecture 2** – Core abilities, technological elements, market opportunities, evaluating attractiveness and creating smart portfolios	Werner Liebregts	● Gruber et al. (2008)** ● Gruber et al. (2013)** ● Gruber et al. (2015)*
		Nov 22	**Tutorial 2** – Guest tutorial titled *Building Rock-Solid Teams*, team formation (if still needed at this point) and further team alignment	Werner Liebregts Doron Zilbershtein Norbert Kleijn (i.a., Founderpro)	
	3	Nov 29	**Tutorial 3** – Evaluating the attractiveness of your identified market opportunities and building a smart portfolio around your primary market opportunity	Doron Zilbershtein	
	4	Dec 4	**Lecture 3** – Designing business models, the Business Model Canvas and the Lean Canvas	Werner Liebregts	● Chesbrough (2010)** ● Guo et al. (2020)** ● Massa et al. (2017)** ● Zott et al. (2011)*
		Dec 6	**Tutorial 4** – Completing a Lean Canvas and a corresponding Value Proposition Canvas **> Dec 8: Deadline day draft version Lean Canvas**	Doron Zilbershtein	

	Week	Date	Activities	Lecturers and guests	Reading material
Customer Dev.	5	Dec 11	**Lecture 4** – Customer discovery, customer validation, customer creation and company building **> Today: Deadline day peer feedback Lean Canvas**	Werner Liebregts	• Blank & Dorf (2012)** • Denoo et al. (2022)* • Ries (2011)**
		Dec 13	**Tutorial 5** – Guest tutorial titled *How to Create a Clear and Coherent Lean Canvas* **> Dec 15: Deadline day final version Lean Canvas (20%)**	Werner Liebregts Doron Zilbershtein Roelof Vuurboom (i.a., ACE)	
Product Dev.	6	Dec 18	**Lecture 5** – Building Minimum Viable Products (MVPs), validated learning through experimentation and pivots	Werner Liebregts	• Achtenhagen et al. (2013)** • Bocken & Snihur (2020)* • Wood et al. (2019)**
	7	N/A	CHRISTMAS HOLIDAYS		
	8	N/A			
Pitching	9	Jan 8	**Lecture 6** – Pitches, investors and investment decisions **> Today: Deadline day Pitch (20%)**	Werner Liebregts	• Chen et al. (2009)** • Jiang et al. (2022)** • Warnick et al. (2021)*
		Jan 10	**Pitch Training** – A pitch training for everyone, aimed at improving your pitch skills in preparation of the pitch competition in five days from now	Werner Liebregts Doron Zilbershtein Nathalie Mangelaars (Pitch Academy)	
	10	Jan 15	**Pitch Competition** – A final pitch competition between the eight best-performing teams (N.B.: Only to be announced at the start of the session!)	Werner Liebregts Doron Zilbershtein Alex Jakobs (BOM) Betsy Lindsey (Aircision) Geert van de Wouw (IQONIC)	N/A
		Jan 17	**Tutorial 6** – Looking back on the pitch competition, tips and tricks for the written exam and room for questions	Werner Liebregts Doron Zilbershtein	

Important notes:

- Course schedule may be subject to changes, which will then be communicated via timely announcements on Canvas.
- **Lectures** (marked blue, N=6) will take place in CZ 10 (Cobbenhagen building, Tilburg University, Tilburg) on Wednesdays from 14:45 to 16:30 CET[3].
- **Tutorials** (marked green, N=6) will take place in DPZ 6 (Deprez building, Tilburg University, Tilburg) on Fridays from 09:45 to 12:30 CET[4].
- Notable exceptions (marked yellow, N=2):
    - The **pitch training** will take place in DPZ 6 (Deprez building, Tilburg University, Tilburg) on Friday January 10, either from 08:45 to 10:30 CET or from 10:45 to 12:30 CET. A clear division of teams will be announced in a timely manner.
    - The **pitch competition** will take place in DPZ 6 (Deprez building, Tilburg University, Tilburg) on Wednesday January 15 from 13:45 to 17:30 CET. A detailed schedule will be made available in a timely manner.
- Weekly office hours are provisionally scheduled on Fridays from 16:00 to 17:00 CET. Please notify the course coordinator in advance if you would like to make use of any of these opportunities, and a meeting will be planned accordingly.
- Compulsory reading material is indicated with one asterisk (*). See below for a reference list with all the reading material.
- Supplementary reading material is indicated with two asterisks (**). See below for a reference list with all the reading material.

[3] N.B.: This may differ from what your online schedule indicates (in MyTimetable), as on Wednesdays we generally have a time slot available from 13:45 to 17:30 CET.
[4] N.B.: This may differ from what your online schedule indicates (in MyTimetable), as on Fridays we generally have a time slot available from 08:45 to 12:30 CET.

Course summary

#	Description	Percentage	Individual/ team	Due by		
				Day	Date	Time
1	Lean Canvas – Draft version	N/A	Team	Sunday	Dec 8	17:30 CET
	Lean Canvas – Peer feedback	N/A	Team	Wednesday	Dec 11	13:30 CET
	Lean Canvas – Final version	20%	Team	Sunday	Dec 15	17:30 CET
2	Pitch	20%	Team	Wednesday	Jan 8	13:30 CET
3	Written Exam	60%	Individual	Thursday	Jan 30	12:00 CET

Important notes:

- In order to pass the course, a minimum grade of 5.0 is required for the written exam (60%, individual). Obviously, one also needs to obtain a final grade of at least a 5.5 as a result of the weighted average of all three partial grades, as this will be rounded off to a 6.0.
- If you fail the written exam (60%, individual), then you will have the opportunity to participate in a resit exam on Thursday April 24 (from 18:00 to 21:00 CET).

Assignments – Team (40%)

Lean Canvas (20%)

The Lean Canvas by Ash Maurya (2010) is a slightly adapted version of the Business Model Canvas by Alexander Osterwalder (around 2008). The Business Model Canvas is a widely adopted strategic management template to develop new business models (or to document existing ones). The Lean Canvas consists of nine relevant building blocks, just like the Business Model Canvas, but some of them have been replaced to better fit the specific needs of businesses in their early stages.

As a team, you are supposed to fill in the Lean Canvas based on your data-driven business idea. You can find two useful templates on Canvas > Files, but you are also allowed to create or find another one yourselves. Using a Lean Canvas will help you with aligning your activities, because – if done *right* – it nicely illustrates what the identified problem is, who the problem owners are, what your solution to their problem is, and much more. Doing this right is harder than you might think at first glance, so think about and discuss each of its elements very thoroughly. Also make sure to attend the tutorials on December 6 and 13, in which we will extensively discuss how to complete a Lean Canvas.

Please submit the final version of your Lean Canvas as a PDF on Sunday December 15 (17:30 CET) at the latest through Canvas > Assignments. Late submissions will NOT be graded. Your grade will be based on (1) clarity (i.e., comprehensibility for an outsider) and (2) coherency (i.e., alignment between the various elements). Much more information about all this will be shared in course weeks 4 and 5.

Pitch (20%)

By the end of the course, one or a few representatives per team will clarify and defend their business idea during a pitch in Dragons' Den (UK) or Shark Tank (US) style. A jury consisting of *real* investors will decide which team held the most convincing pitch of about 3 minutes, directly followed by a Q&A of about 7 minutes. The investors might even be willing to offer you "prizes", such as participation in one of their incubator programs, continued business coaching and/or access to their extensive networks.

Be aware, however, that only the eight best-performing teams will qualify for this final pitch competition (N.B.: Only to be announced at the start of the session!). All teams are supposed to submit (1) a recorded pitch, (2) the corresponding pitch script, and (3) the corresponding slide deck on Wednesday January 8 (13:30 CET) at the latest. These submissions will be evaluated using the following criteria: (1) Preparedness and (2) pitch skills. Preparedness refers to, amongst others, a clear and complete pitch script and a good-looking slide deck with relevant and accurate information. Pitch skills include both verbal and nonverbal behavioral cues, like a pleasant tone of voice, a confident posture and the use of functional gestures. The grade is awarded to the team, so make sure to divide the work effort properly among all its members.

On Friday January 10, we offer a pitch training to all of you. After all, your team might be among the eight best-performing teams that have qualified for the pitch competition. This pitch competition will take place on Wednesday January 15 from 13:45 to 17:30 CET. Both the pitch training and pitch competition will be organized in the Deprez building, located next to Tilburg's central train station. Everyone is expected to attend the festive closing event, to enjoy each other's performance, and to learn by example.

Assignments – Individual (60%)

Written Exam (60%)

The written exam will take place on Thursday January 30 (from 09:00 to 12:00 CET) and will last up to three hours (without extra time). It will test your knowledge and understanding of the contents of all lectures, tutorials and academic journal articles that are part of the compulsory reading material. For every article, you need to know and understand their core messages (main theoretical arguments, main results, main conclusions, main implications, etc.). The contents of the academic journal articles that have been listed as supplementary reading material will NOT be part of the exam as far as they have not been discussed during lectures and/or tutorials.

The written exam only includes open-ended questions. Most of them require higher-order thinking (instead of *just* reproducing knowledge, for example). As such, we place a strong emphasis on academic reasoning, which means that you are supposed to provide proper argumentation for every statement you make, preferably based on theoretical and empirical insights gained throughout the course. Typically, such higher-order thinking requires you to understand the content very well, so that you can think across different topics.

The written exam will be a digital test using TestVision. It therefore takes place in one of the computer rooms of Tilburg University (TBA). You will be informed about how digital testing works in a timely manner. If you fail the written exam, then you will have the opportunity to participate in a resit exam on Thursday April 24 (from 18:00 to 21:00 CET).

Data-driven business idea

For the development of your data-driven business idea, our starting point is to have as few rules as possible, so that the course resembles "the real world" as much as possible. However, we obviously need some rules to guide you all through (part of) a typical developmental process of a business idea in a fair and balanced way.

First, teams generally consist of five individuals. However, some exceptions may apply. Please contact the course coordinator for special requests. There is no random or teacher-determined allocation, but teams are formed by yourselves instead. Please do so as soon as possible, and then immediately sign up for a team on Canvas > People.

Second, it is allowed to have people involved in the team, who are not participating in this course. However, still make sure not to exceed the maximum of five individuals per team. Obviously, external team members are not obliged to meet the course requirements.

Third, it is allowed to continue working on a business idea that has been generated and partly developed before the start of this course, as long as it is data-driven (see rule 4 below). Here, we do not mean a business that is already fully operational and prepared to scale up. If there is anything unclear or if you are in doubt, then please contact the course coordinator to discuss things.

Fourth, we expect you to exploit your data science knowledge in developing a business idea. That is, your (final) solution to an identified problem must be AI-, data- and/or technology-driven in one way or another. We also expect you to emphasize and clearly explain the data science element of your business idea, both in your Lean Canvas and during your pitch.

Since every startup process is different, there is no one timeline that must be followed. Nevertheless, the course is organized along the following four generic stages:

1. Entrepreneurial team formation (course weeks 1-2)
2. Idea generation, evaluation and selection (roughly course weeks 1-5)
3. Experimentation and validated learning (roughly course weeks 4-9)
4. Pitching your business idea (roughly course weeks 9-10)

New businesses typically do not grow linearly through the four stages above. For instance, an entrepreneurial team could be willing to add a new member (i.e., stage 1), because experimental results (i.e., stage 3) indicated that a member with certain competences and skills was missing. However, this course (probably) is your first encounter with new business creation and management, and therefore we suggest you to only move on to the next stage upon completion of the previous one. Completion of a stage is marked by your ability to make a convincing case about your progress (i.e., evidence-based, and preferably empirically supported).

The compulsory and supplementary reading material may help you to make decisions, and we urge you to also consider other sources beyond the ones preselected by us. We challenge you to to get as far as realistically possible overall by testing your business idea in the *real* world. In general, we believe that considerable progress and new business development is quite possible for every team. **Please do NOT worry about failing to validate business assumptions and/or a possible need to 'pivot' to an adjusted or a completely different business idea, because this is also considered progress!**

As you can see, this course is practice-oriented (yet evidence-based!) and quite different from what you are used to when taking other courses. We really hope that you take this opportunity to find out whether you can become a successful next-generation entrepreneur or intrapreneur (i.e.,

entrepreneurial employee) that builds upon his/her data science knowledge. Do not take this as a 'regular' course project but aim to make a real and serious effort. We are prepared to help you, so if you have doubts, questions or when you are stuck altogether, please do not hesitate to reach out to us!

Wishing you the best of luck!

AI policy

We expect you to use AI-based tools (LLMs, image generation tools, etc.) throughout this course, for example when looking for inspiration during your ideation process or when drafting or crafting text for your pitch. This is allowed and even encouraged (taking into account a few rules, see below).

In fact, this is likely to lead to more and better ideas, and hence, to more efficient and effective new business development (for example, see here). Entrepreneurship and management scholar Ethan Mollick (The Wharton School, University of Pennsylvania) provides online tutorials about how to use AI effectively in a variety of ways, including coming up with ideas (for example, see here and here).

We would be happy to meet and discuss anything related to the use of AI for course-related activities, for example during office hours. Just let us know!

Having said that, please be aware of the limits of LLMs:

- If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts in order to get good outcomes. It will take time to get familiar with what works and what does not. Experiment!
- Do not trust anything it provides as an answer. Assume that it is wrong, unless you either know the answer or can check it with another source. You are responsible for any errors or omissions provided by the AI tool. It works best for topics you deeply understand.
- Be thoughtful about when the AI tool is useful. Do not use it if it is not appropriate for a specific case or circumstance.

Important (!): Note that you are required to acknowledge the use of any AI-based tool for any type of course work (including ChatGPT, no matter how little). For example, include a small note or paragraph at the end of any assignment for which you have used AI, explaining what you have used AI for, and what prompts you have used to get to the result(s). Failure to do so is in violation of academic honesty polies.

Reading material

Compulsory (*)

Blank, S. (2013). Why the Lean Start-Up Changes Everything. *Harvard Business Review, 91*(5), 63-72.

Bocken, N., & Snihur, Y. (2020). Lean Startup and the Business Model: Experimenting for Novelty and Impact. *Long Range Planning*, *53*(4), 101953.

Denoo, L., Yli-Renko, H., & Clarysse, B. (2022). The Impact of Customer Ties and Industry Segment Maturity on Business Model Adaptation in an Emerging Industry. *Strategic Entrepreneurship Journal*, *16*(3), 602-632.

Gruber, M., Kim, S.M., & Brinckmann, J. (2015). What is an Attractive Business Opportunity? An Empirical Study of Opportunity Evaluation Decisions by Technologists, Managers, and Entrepreneurs. *Strategic Entrepreneurship Journal, 9*(3), 205–225.

Shepherd, D.A., & Gruber, M. (2021). The Lean Startup Framework: Closing the Academic-Practitioner Divide. *Entrepreneurship Theory and Practice, 45*(5), 66-90.

Warnick, B.J., Davis, B.C., Allison, T.H., & Anglin, A.H. (2021). Express Yourself: Facial Expression of Happiness, Anger, Fear, and Sadness in Funding Pitches. *Journal of Business Venturing, 36*(4), 106109.

Zott, C., Amit, R., & Massa, L. (2011). The Business Model: Recent Developments and Future Research. *Journal of Management, 37*(4), 1019–1042.

Supplementary (**)

Achtenhagen, L., Melin, L., & Naldi, L. (2013). Dynamics of Business Models – Strategizing, Critical Capabilities and Activities for Sustained Value Creation. *Long Range Planning*, *46*(6), 427-442.

Blank, S., & Dorf, B. (2012). *The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company*. K&S Ranch Publishing Inc.

Camuffo, A., Cordova, A., Gambardella, A., & Spina, C. (2020). A Scientific Approach to Entrepreneurial Decision Making: Evidence from a Randomized Control Trial. *Management Science, 66*(2), 564-586.

Chen, X.P., Yao, X., & Kotha, S. (2009). Entrepreneur Passion and Preparedness in Business Plan Presentations: A Persuasion Analysis of Venture Capitalists' Funding Decisions. *Academy of Management Journal, 52*(1), 199-214.

Chesbrough, H. (2010). Business Model Innovation: Opportunities and Barriers. *Long Range Planning*, *43*(2–3), 354–363.

Felin, T., Gambardella, A., Stern, S., & Zenger, T. (2020). Lean Startup and the Business Model: Experimentation Revisited. *Long Range Planning, 53*(4), 101889.

Gruber, M., MacMillan, I.C., & Thompson, J.D. (2008). Look Before You Leap: Market Opportunity Identification in Emerging Technology Firms. *Management Science, 54*(9), 1652–1665.

Gruber, M., MacMillan, I.C., & Thompson, J.D. (2013). Escaping the Prior Knowledge Corridor: What Shapes the Number and Variety of Market Opportunities Identified Before Market Entry of Technology Start-Ups? *Organization Science, 24*(1), 280–300.

Guo, H., Wang, C., Su, Z., & Wang, D. (2020). Technology Push or Market Pull? Strategic Orientation in Business Model Design and Digital Start-Up Performance. *Journal of Product Innovation Management*, *37*(4), 352-372.

Jiang, L., Yin, D., Liu, D., & Johnson, R. (2022). The More Enthusiastic, the Better? Unveiling the Negative Pathway from Entrepreneurs' Displayed Enthusiasm to Funders' Funding Intentions. *Entrepreneurship Theory and Practice*, 1-33.

Massa, L., Tucci, C.L., & Afuah, A. (2017). A Critical Assessment of Business Model Research. *Academy of Management Annals, 11*(1), 73–104.

Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Books.

Wood, M.S., Palich, L.E., & Browder, R.E. (2019). Full Steam Ahead or Abandon Ship? An Empirical Investigation of Complete Pivot Decisions. *Journal of Small Business Management*, *57*(4), 1637-1660.