

Syllabus

New Product Development

- Instructor: Mr. Vivék P. Pundír
- Office Hours: By appointment
- Credits: 2cr (4 ECTS)
- Term: Spring 2018 (May 2018-Jul 2018)
- Course level: Executive MBA
- Prerequisites: N.A.

Course description

New products are one of the few tools available to companies to achieve truly breakthrough growth. How new products are developed is undergoing the biggest fundamental transformation since the industrial revolution.

This course teaches modern tools, techniques and methods for product design and development. The capstone is a project in which teams conceive, design and develop a product. This course immerses students in the new product development process with the objective of learning these key tools, techniques and methods.

Learning outcomes

This course will seek to arm students with strategies, approaches and perspectives they will need to create breakthrough products and services. We will emphasize how to uncover opportunities to create value, and then design and configure offerings that capitalize on these opportunities.

At the completion of the course, the student should be:

- Competent with a set of tools and methods for product design and development.
- Aware of the role of multiple functions (e.g. strategy, marketing, engineering, legal, customer service, finance, supply chain, operations, etc.) in creating a new product.
- Able to co-ordinate cross-disciplinary teams to achieve a common objective.
- Leverage past experience and specific knowledge from other courses through practice and reflection in an action-oriented setting.

Key topics

- Introduction and design thinking
- Tools for brainstorming
- Customer need analysis and factor analysis
- Product life cycle, innovation diffusion and crossing the chasm
- Disruptive innovation and the innovator's dilemma
- Network effects and standards
- Product specifications
- Product architecture and modularity
- Mass customization and platforms
- Agile development: Scrum; Kanban; Prototyping
- Forecasting and business case development
- Marketing strategy and cluster analysis/ discriminant analysis
- Pricing and conjoint analysis
- Go-to-market plans
- Contemporary topics in NPD: Open innovation; User innovation; Crowdsourcing; Free innovation
- Continuous innovation and creating a culture of innovation

Reading list

Books:

- Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6

Magazine Articles:

- Wieners, B.; Lego Is for Girls; Bloomberg BusinessWeek, 16 December 2011; <https://www.bloomberg.com/news/articles/2011-12-14/lego-is-for-girls>
- Orihuela, R.; Zara Follows Shoppers Into Bedroom; Bloomberg BusinessWeek, 18 December 2014; <https://www.bloomberg.com/news/articles/2014-12-18/zara-home-inditexs-bedroom-foray>
- Gershenfeld, N.; How to Make Almost Anything; Foreign Affairs, November/December 2012; <https://www.foreignaffairs.com/articles/2012-09-27/how-make-almost-anything>
- Levitt, T.; Exploit the Product Life Cycle; Harvard Business School, November 1965; <https://hbr.org/1965/11/exploit-the-product-life-cycle>
- Editorial; Network effects; The Economist, Dec 17th 2009; <http://www.economist.com/node/15108618>
- Zimmermann, N.; Network effects helped Facebook win; DW, 08 Sep 2017; <http://www.dw.com/en/network-effects-helped-facebook-win/a-40418818>
- Croslin, B.; Disney's \$1 Billion Bet on a Magical Wristband; Wired, March 2015; <https://www.wired.com/2015/03/disney-magicband/>
- Mullenweg, M.; 1.0 Is the Loneliest Number; Matt's Blog, 9 November 2010; <https://ma.tt/2010/11/one-point-oh/>
- Spool, J. M.; The \$300 Million Button; User Interface Engineering, 2009; https://articles.ue.com/three_hund_million_button/
- Chesbrough, H. W.; Can't Afford to Innovate? Open up!; Forbes, 29 March 2011; <https://www.forbes.com/sites/henrychesbrough/2011/03/29/cant-afford-to-innovate-open-up/>
- Chesbrough, H. W.; Competing for Contributors in Open Innovation; Forbes, 9 May 2011; <https://www.forbes.com/sites/henrychesbrough/2011/05/09/competing-for-contributors-in-open-innovation/>
- Chesbrough, H. W.; From Products to Services: How Medellín, Colombia is Overcoming the Commodity Trap; Forbes, 23 March 2011; <https://www.forbes.com/sites/henrychesbrough/2011/03/23/from-products-to-services-how-medillin-colombia-is-overcoming-the-commodity-trap/>
- May, M. E.; The Rules Of Successful Skunk Works Projects; Fast Company, 9 October 2012; <https://www.fastcompany.com/3001702/rules-successful-skunk-works-projects>
- Blank, S. G.; Why Corporate Skunk Works Need to Die; Forbes, 10 November 2014; <https://www.forbes.com/sites/steveblank/2014/11/10/why-corporate-skunk-works-need-to-die/>
- Denning, S.; Is Continuous Innovation Too Risky?; Forbes, 10 February 2012; <https://www.forbes.com/sites/stevedenning/2012/02/10/is-radical-management-too-risky/>

- Merchant, B.; The Secret Origin Story of the iPhone; The Verge, 13 June 2017; <https://www.theverge.com/2017/6/13/15782200/one-device-secret-history-iphone-brian-merchant-book-excerpt>
- Robertson, D. H.; Lilly Open Innovation Drug Discovery Program; Eli Lilly and Company, 6 August 2013; <https://www.chemaxon.com/app/uploads/2013/07/Daniel-Robertson-Eli-Lilly.pdf>

Videos (recommended):

- Rose, C. and Kelley, D.; How to design breakthrough inventions; CBS News, 60 minutes, 06 January 2013; <https://www.youtube.com/watch?v=9TIspgTbLM>
- Grant, A.; The surprising habits of original thinkers; TED Talks; <https://www.youtube.com/watch?v=fxbCHn6gE3U>
- Gilbert, E.; Your elusive creative genius; TED Talks; <https://www.youtube.com/watch?v=86x-u-tz0MA>
- Ferguson, K.; Creativity is a remix; TED Talks; <https://www.youtube.com/watch?v=zd-dqUuvLk4>
- Burstein, J.; 4 Lessons in Creativity; TED Talks; https://www.youtube.com/watch?v=sY0Pf_pfqCI
- Johnson, S.; Where good ideas come from; TED Talks; <https://www.youtube.com/watch?v=0af00UcTO-c>
- Donnelly, P.; How stats fool juries; TED Talks; <https://www.youtube.com/watch?v=kLmzxmRcUTo>
- Behar, Y.; Designing objects that tell stories; TED Talks; <https://www.youtube.com/watch?v=QGn8F4j6pH8>
- Gates, W. H.; Innovating to zero!; TED Talks; <https://www.youtube.com/watch?v=JaF-fq2Zn7I>

Journal Articles (recommended):

- von Hippel, E. and Katz, R.; Shifting innovation to users via toolkits; Management Science, vol 48, No. 7 (July) pp. 821-833; <https://evhippel.files.wordpress.com/2013/08/von-hippel-and-katz-toolkits.pdf>
- Thomke, S. and von Hippel, E.; Customers as Innovators: A New Way to Create Value; Harvard Business Review, vol 80, No. 4 (April) pp. 74-81; <https://evhippel.files.wordpress.com/2013/08/hbrtoolkitsaspub.pdf>
- Brown, T.; Design Thinking; Harvard Business Review, June 2008 pp. 84-92; <https://hbr.org/2008/06/design-thinking>
- Thomke, S. and Fujimoto, T.; The Effect of “Front-Loading” Problem-Solving on Product Development Performance; The Journal of Product Innovation Management, vol 17 issue 2, March 2000 pp. 128-142
- Suarez, F. and Lanzolla G.; The Half-Truth of First-Mover Advantage; Harvard Business Review, April 2005; <https://hbr.org/2005/04/the-half-truth-of-first-mover-advantage>
- Ogawa, S. and Piller, F. T.; Reducing the Risks of New Product Development; MIT Sloan

Management Review, 01 January 2006; <http://sloanreview.mit.edu/article/reducing-the-risks-of-new-product-development/>

- Cooper, R. and Slagmulder, R.; Develop Profitable New Products with Target Costing; MIT Sloan Management Review, Summer 1999; <http://sloanreview.mit.edu/article/develop-profitable-new-products-with-target-costing/>
- Alizon, F. and Shooter, S. B. and Simpson, T. W.; Improving an existing product family based on commonality/diversity, modularity, and cost; Design Studies, vol 28 issue 4, July 2007 pp. 387-409
- Simpson, T. W.; Product platform design and customization: Status and promise; Artificial Intelligence for Engineering Design, Analysis and Manufacturing, vol 18, 2004 pp. 3-20; https://pdfs.semanticscholar.org/9e22/86da5ac2f3f66dbd6710c9b4fa2719ace948.pdf?_ga=2.168458721.1975221693.1509984799-1511656006.1509984799
- Norman, D. A.; Words Matter. Talk About People: Not Customers, Not Consumers, Not Users; Interactions, September+October 2006 pp. 49,63; https://www.researchgate.net/publication/202165731_Words_matter_Talk_about_people_-_Not_customers_not_consumers_not_users

Books (recommended):

- Kelley, T.; The Art of Innovation; Doubleday; ISBN: 0-385-49984-1
- Cross, N.; Design Thinking; Bloomsbury Academic; ISBN: 978-1-84-788636-1
- Sutton, R.I.; Weird Ideas That Work; The Free Press; ISBN: 0-7432-1212-6
- De Bono, E.; Lateral Thinking; Harper Perennial; ISBN: 978-0-06-090325-1
- De Bono, E.; Five-Day Course in Thinking; Vermilion London; ISBN: 978-1-78-504086-3
- Roth, B.; The Achievement Habit; Harper Collins; ISBN: 978-0-06-235610-9
- von Hippel, E.; Free Innovation; The MIT Press; ISBN: 978-0-26-203521-7; https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2866571
- Christensen, C.M.; The Innovator's Dilemma; Harvard Business Review Press; ISBN: 978-1-63-369178-0
- Moore, G.A.; Crossing the Chasm; HarperBusiness; ISBN: 978-0-06-235394-8
- Chesbrough, H. W.; Open Innovation; Harvard Business Review Press; ISBN: 978-1-42-210283-1
- Blank, S. G.; The Four Steps to the Epiphany; K&S Ranch; ISBN: 978-0-98-920050-9
- The Scrum Alliance; The Scrum Guide; Scrum.Org and ScrumInc; <https://www.scrumalliance.org/why-scrum/scrums-guide>

Assessment

Assignment	% of final grade
Individual in-class participation	20%
Individual take-home assignment (INDASS)	20%
Team-based assignment (GRPASS)	20%
Team-based project (GRPPR)	40%

Assignment: Individual in-class participation

Weighting (% of final grade): 20%

Description of Assignment:

Active and consistent participation is not the same as just talking a lot in class. The quality of what you say (or write) and the quality of your listening and responsiveness to others are important components of your evaluation in this course. You may expect to be called upon (even if you have not volunteered), and you should be prepared to contribute your ideas and insights.

Quality Indicators (how will it be graded; what constitutes a good assignment):

You will be expected to contribute in an active and constructive way to debate and discussion in class. As future leader in business, taking a view and being able to credibly defend it is an invaluable skill.

Moreover, listening skills and the ability to understand your colleagues and peers will also be considered. Quality, rather than quantity of contribution is the essence of the grade you will receive.

Excellent: Regular and constructive contribution to discussion in nearly every class. I'm ready to begin when class begins. I have no absences and I return from breaks promptly

Good: Frequent participation in discussion. Most of my contributions are short responses to easy questions. I'm ready to begin when class begins. I am sometimes late getting back to class after breaks.

Needs Improvement: Few interventions and contributions in class. Passive attendance. When called on, I may not have been well prepared. I have arrived late to two or more classes and/or have missed sessions during the class. I am typically late getting back to class after breaks.

Your classmates will evaluate your participation.

Assignment: Individual take-home assignment INDASS – Project Idea

Weighting (% of final grade): 20%

Description of Assignment:

The individual take-home assignment will expect you to synthesize course content, harness your creativity, draw upon your experience and develop a short new product pitch.

Specifically, you will present your 3 minute product pitch to your classmates, as if you were presenting to your company's Board.

You will also create a more detailed pitch document of 4-6 A4 pages, single spaced, 12pt font. Please submit the document in Microsoft Word format.

Based on your pitch, your classmates will bid to join your team (4 students per team) for the group assignment and group project. If more than 4 people bid to join you, you can select which 4 you accept in your team. People who receive no or few bids, and also haven't been accepted into any group, will be assigned to groups which have fewer than 4 members.

Quality Indicators (how will it be graded; what constitutes a good assignment):

The team assignment process may appear to be an indicator of quality, but from the perspective of grading, it shall not be considered. The key quality indicators are:

- Mastery of subject matter.
- Novelty of the product idea.
- Feasibility of the product idea.
- Supporting research and analysis.
- Spelling, grammar and referencing.

Assignment: Team-based assignment GRPASS – Assignment Topic

Weighting (% of final grade): 20%

Description of Assignment:

Each course participant will, in a team (4 students per team), work on developing a new product. The first group assignment is a well-developed product plan.

Each team will submit a product plan document of 12-16 A4 pages, single spaced, 12pt font. Please submit the document in Microsoft Word format.

Quality Indicators (how will it be graded; what constitutes a good assignment):

Grades will be awarded on the basis of:

- Mastery of subject matter.
- Novelty of the product idea.
- Feasibility of the idea.
- Detailed research and analysis.
- Spelling, grammar and referencing.

Project: Team-based project GRPPRJ – New Product Developed

Weighting (% of final grade): 40%

Description of Assignment:

Each course participant will, in a team (4 students per team), work on developing a new product. The final group assignment is a comprehensive proposal, including financials and go-to-market plan.

Each team will submit a proposal document of 20-25 A4 pages, single spaced, 12pt font. Please submit the document in Microsoft Word format.

Each team will also present its proposal to classmates, as if presenting to a company's Board or to a VC.

Quality Indicators (how will it be graded; what constitutes a good assignment):

Grades will be awarded on the basis of:

- Mastery of subject matter.
- Novelty of the product idea.
- Feasibility of the idea.
- Detailed research and analysis.
- Depth of financial forecasting.
- Depth of marketing plan.
- Quality of presentation.
- Spelling, grammar and referencing.

Course schedule and materials for each session

Class	1	Time	Saturday, May 5, 2018 15:15-18:00
Topics	<ul style="list-style-type: none"> • Introduction and design thinking • Tools for brainstorming • Customer need analysis and factor analysis 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> • Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6; ; Chapter 3, Chapter 5, Chapter 7, Chapter 8, Chapter 9 • Wieners, B.; Lego Is for Girls; Bloomberg BusinessWeek, 16 December 2011 • Orihuela, R.; Zara Follows Shoppers Into Bedroom; Bloomberg BusinessWeek, 18 December 2014 • Recommended: <ul style="list-style-type: none"> ○ Kelley, T.; The Art of Innovation; Doubleday; ISBN: 0-385-49984-1 ○ Cross, N.; Design Thinking; Bloomsbury Academic; ISBN: 978-1-84-788636-1 ○ Sutton, R.I.; Weird Ideas That Work; The Free Press; ISBN: 0-7432-1212-6 ○ Brown, T.; Design Thinking; Harvard Business Review, June 2008 pp. 84-92 		

Class	2	Time	Sunday, May 6, 2018 11:45-14:30
Topics	<ul style="list-style-type: none"> • Product life cycle; Innovation diffusion; Crossing the chasm • Disruptive innovation; The innovator's dilemma 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> • Croslin, B.; Disney's \$1 Billion Bet on a Magical Wristband; Wired, March 2015 • Levitt, T.; Exploit the Product Life Cycle; Harvard Business School, November 1965 • Recommended: <ul style="list-style-type: none"> ○ Moore, G.A.; Crossing the Chasm; HarperBusiness; ISBN: 978-0-06-235394-8 ○ Christensen, C.M.; The Innovator's Dilemma; Harvard Business Review Press; ISBN: 978-1-63-369178-0 ○ De Bono, E.; Lateral Thinking; Harper Perennial; ISBN: 978-0-06-090325-1 ○ De Bono, E.; Five-Day Course in Thinking; Vermilion London; ISBN: 978-1-78-504086-3 		

	<ul style="list-style-type: none"> ○ Roth, B.; The Achievement Habit; Harper Collins; ISBN: 978-0-06-235610-9 ○ Suarez, F. and Lanzolla G.; The Half-Truth of First-Mover Advantage; Harvard Business Review, April 2005
Assignment	You will pitch your idea and submit the individual assignment INDASS.

Class	3	Time	Saturday, May 26, 2018 15:15-18:00
Topics	<ul style="list-style-type: none"> ● Network effects and standards ● Product specifications 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> ● Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6; Chapter 6 ● Editorial; Network effects; The Economist, Dec 17th 2009 ● Zimmermann, N.; Network effects helped Facebook win; DW, 08 Sep 2017 ● Gershenfeld, N.; How to Make Almost Anything; Foreign Affairs, November/December 2012 ● Chesbrough, H. W.; From Products to Services: How Medellín, Colombia is Overcoming the Commodity Trap; Forbes, 23 March 2011 ● Spool, J. M.; The \$300 Million Button; User Interface Engineering, 2009 ● Recommended: <ul style="list-style-type: none"> ○ Thomke, S. and Fujimoto, T.; The Effect of “Front-Loading” Problem-Solving on Product Development Performance; The Journal of Product Innovation Management, vol 17 issue 2, March 2000 pp. 128-142 ○ Norman, D. A.; Words Matter. Talk About People: Not Customers, Not Consumers, Not Users; Interactions, September+October 2006 pp. 49,63 ○ Blank, S. G.; The Four Steps to the Epiphany; K&S Ranch; ISBN: 978-0-98-920050-9 		

Class	4	Time	Sunday, May 27, 2018 11:45-14:30
Topics	<ul style="list-style-type: none"> ● Product architecture and modularity ● Mass customization and platforms 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> ● Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6; Chapter 10, Chapter 11 ● Recommended: <ul style="list-style-type: none"> ○ Alizon, F. and Shooter, S. B. and Simpson, T. W.; Improving an existing product family based on commonality/diversity, 		

	<p>modularity, and cost; Design Studies, vol 28 issue 4, July 2007 pp. 387-409</p> <ul style="list-style-type: none"> ○ Simpson, T. W.; Product platform design and customization: Status and promise; Artificial Intelligence for Engineering Design, Analysis and Manufacturing, vol 18, 2004 pp. 3-20
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Class	5	Time	Saturday, June 16, 2018 15:15-18:00
Topics	<ul style="list-style-type: none"> ● Agile development: Scrum; Kanban; Prototyping 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> ● Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6; Chapter 14, Chapter 19 ● Mullenweg, M.; 1.0 Is the Loneliest Number; Matt's Blog, 9 November 2010 ● Recommended: <ul style="list-style-type: none"> ○ The Scrum Alliance; The Scrum Guide; Scrum.Org and ScrumInc 		
Assignment	You will submit your group assignment GRPASS.		

Class	6	Time	Sunday, June 17, 2018 11:45-14:30
Topics	<ul style="list-style-type: none"> ● Forecasting and business case development ● Marketing strategy and cluster analysis/ discriminant analysis ● Pricing and conjoint analysis ● Go-to-market plans 		
Preparation	<p>Read:</p> <ul style="list-style-type: none"> ● Ulrich, K. and Eppinger, S.; Product Design and Development; McGraw Hill; ISBN: 978-0-07-802906-6; Chapter 18 ● Recommended: <ul style="list-style-type: none"> ○ Ogawa, S. and Piller, F. T.; Reducing the Risks of New Product Development; MIT Sloan Management Review, 01 January 2006 ○ Cooper, R. and Slagmulder, R.; Develop Profitable New Products with Target Costing; MIT Sloan Management Review, Summer 1999 		

Class	7	Time	Saturday, July 7, 2018 15:15-18:00
Topics	<ul style="list-style-type: none"> ● Contemporary topics in NPD: Open innovation; User innovation; Crowdsourcing; Free innovation ● Continuous innovation and creating a culture of innovation 		

Preparation	<p>Read:</p> <ul style="list-style-type: none"> • Merchant, B.; The Secret Origin Story of the iPhone; The Verge, 13 June 2017 • May, M. E.; The Rules Of Successful Skunk Works Projects; Fast Company, 9 October 2012 • Blank, S. G.; Why Corporate Skunk Works Need to Die; Forbes, 10 November 2014 • Denning, S.; Is Continuous Innovation Too Risky?; Forbes, 10 February 2012 • Chesbrough, H. W.; Can't Afford to Innovate? Open up!; Forbes, 29 March 2011 • Chesbrough, H. W.; Competing for Contributors in Open Innovation; Forbes, 9 May 2011 • Recommended: <ul style="list-style-type: none"> ○ von Hippel, E.; Free Innovation; The MIT Press; ISBN: 978-0-26-203521-7 ○ Chesbrough, H. W.; Open Innovation; Harvard Business Review Press; ISBN: 978-1-42-210283-1 ○ von Hippel, E. and Katz, R.; Shifting innovation to users via toolkits; Management Science, vol 48, No. 7 (July) pp. 821-833 ○ Thomke, S. and von Hippel, E.; Customers as Innovators: A New Way to Create Value; Harvard Business Review, vol 80, No. 4 (April) pp. 74-81 ○ Robertson, D. H.; Lilly Open Innovation Drug Discovery Program; Eli Lilly and Company, 6 August 2013
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Class	8	Time	Sunday, July 8, 2018 11:45-14:30
Topics	Course wrap-up and Final Presentations		
Assignment	You will present your final group presentations in this session and submit the final project document GRPPRJ.		