

Cairo University  
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# Software Development Process

**Lec. 1 outline:** You'll find all the information you need here on Overall Aims of Course, The Categorization of Product, Software Products and Ideas Behind Them, Different Models Research and Development Process Lifecycle, Minimum Viable Product (MVP), Self-hosted Open edX platform: EdEra courses dashboard..., and so on..

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# References

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- ❑ Software Development From A to Z: A Deep Dive into all the Roles Involved in the Creation of Software, Olga Filipova and Rui Vilao , 2018
- ❑ ISBN-13 (pbk): 978-1-4842-3944-5 ISBN-13 (electronic): 978-1-4842-3945-2
- ❑ <https://doi.org/10.1007/978-1-4842-3945-2>

## **Course notes**

Web support articles and cases study

# Agenda

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- ☐ I Have An Idea!
- ☐ I Have A Product!
- ☐ The Categorization of Product
- ☐ Software Products and Ideas Behind Them
- ☐ Lessons Learned - Part1
- ☐ Different Models
- ☐ Research and Development Process Lifecycle
- ☐ Lessons Learned - Part2
- ☐ Minimum Viable Product (MVP)
- ☐ Self-hosted Open edX platform: EdEra courses dashboard
- ☐ Overall Aims of Course

# I Have An Idea!

- ❑ How do ideas come to us, how they are transformed into something empirical, and why and how they bring success.
- ❑ Idea is a thought or a suggestion that leads to a course of actions. Prepare to run into a lot of these words: plan, design, project, goal.

## Google Definition of Idea

Dictionary

idea

**idea**  
/ɪˈdɪə/

**noun**  
noun: idea; plural noun: ideas; noun: the idea

- a thought or suggestion as to a possible course of action.**  
"recently, the idea of linking pay to performance has caught on"  
*synonyms:* plan, design, scheme, project, proposal, proposition, suggestion, recommendation, aim, intention, objective, object, purpose, end, goal, target  
"our idea is to open a new shop"
- a mental impression.**  
"our menu list will give you some idea of how interesting a low-fat diet can be"  
*synonyms:* concept, notion, conception, conceptualization, thought, image, mental picture, visualization, abstraction, perception; hypothesis, postulation  
"the idea of death scares her"
- an opinion or belief.**  
"nineteenth-century ideas about drinking"  
*synonyms:* thought, theory, view, viewpoint, opinion, feeling, outlook, belief, judgement, conclusion  
"Elizabeth had other ideas on the subject"
- the aim or purpose.**  
"I took a job with the idea of getting some money together"  
*synonyms:* purpose, point, aim, object, objective, goal, intention, end, end in view, design, reason, use, utility, sense, motive, value, advantage  
"the idea of the letter was to get patients to protest"
- PHILOSOPHY**  
(in Platonic thought) an eternally existing pattern of which individual things in any class are imperfect copies.  
• (in Kantian thought) a concept of pure reason, not empirically based in experience.

Origin

GREEK      GREEK      LATIN

idein → idea → idea

to see      form, pattern      late Middle English

late Middle English (in sense 3): via Latin from Greek *idea* 'form, pattern', from the base of *idein* 'to see'.

# I Have A Product!

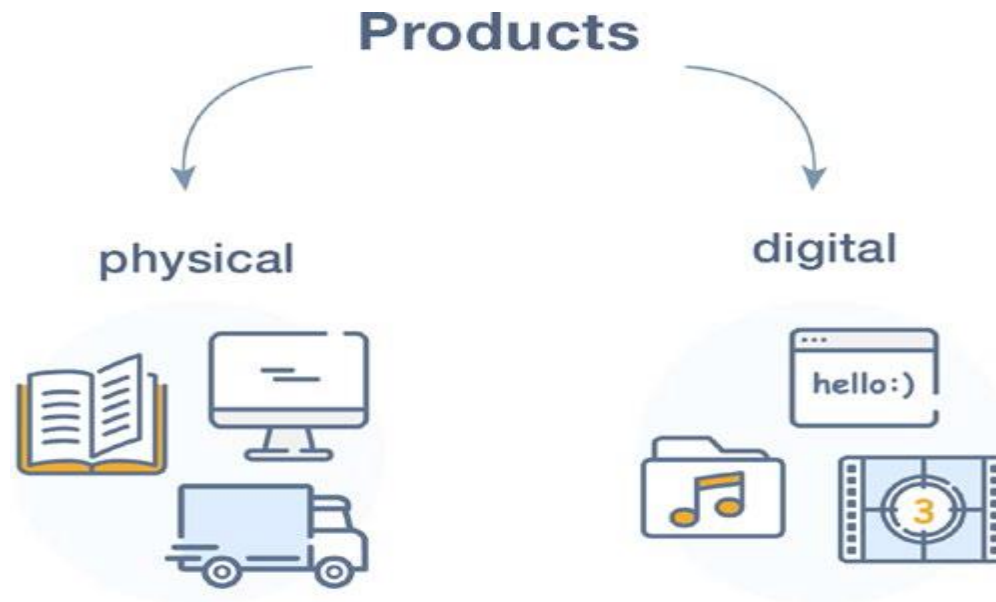
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- ❑ Everything that comes as an idea is a mental visualization of something
- ❑ The general law of humans is that everything that we can see we can build, so each and every visualization or imagination we have can actually be transformed into some product.
- ❑ The goal is to transform the idea into a product.
- ❑ Again, my friend Google defines product as a result of an action or a process.
- ❑ A product is the outcome or result of a course of actions defined as necessary to implement the idea.
- ❑ Result, action, process. Without an action, your idea will remain just an idea forever.
- ❑ Without a clearly defined process of the implementation, you will never reach your goal.
- ❑ And of course, you expect results! You define the expected outcome of your idea and you establish a process to reach it.

# The Categorization of Product

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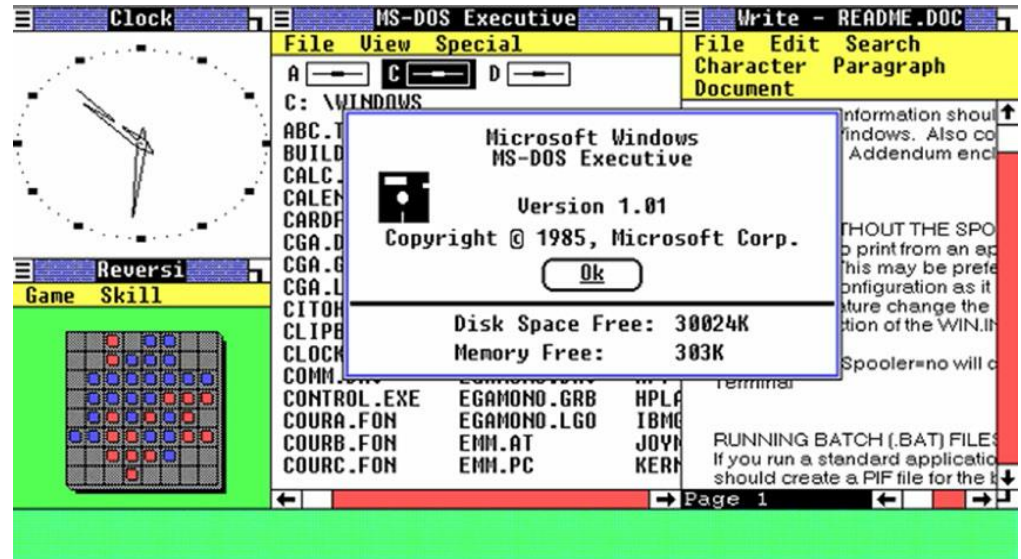
- ❑ Physical products: stapler, notebook, pen, cars, toys, etc.
- ❑ Digital products: software programs, movies, e-books, etc.



**Therefore, the ideas that we are going to talk about are those that lead to the creation of software.**

# Software Products and Ideas Behind Them

- Probably the most widely used software products are operating systems (Windows).
- The first version of MS Windows (1981 when Microsoft decided to build a bit-mapped software interface.) had several applications such as calculator, calendar, Clock, Notepad, Paint



- Microsoft Windows first version in 1985
- The first version was code-named "Interface manager."
- Over the years the program has been enhanced, improved, and polished.

# Lessons Learned - Part1

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- ❑ They are based on experiences distilled from past activities that should be actively taken into account in future actions and behaviors.
- ❑ A very nice way how one should be flexible about their ideas and not be afraid to change the direction of a whole company after realizing that it might solve real customers' problems!
- ❑ Check out the short history behind Google's name here: [https://graphics.stanford.edu/~dk/google\\_name\\_origin.html](https://graphics.stanford.edu/~dk/google_name_origin.html). Nowadays we use tons of google services besides the search engine: Google+, Google analytics, Google cloud solutions, Gmail, etc.
- ❑ As you can see, big software companies always start somewhere, and usually this "somewhere" is someone's idea.
- ❑ Don't be afraid of your ideas, don't be afraid of sharing them, and don't be afraid of moving forward with them.
- ❑ One in millions of spermatozoids inevitably becomes a human being, the same way one of many ideas, if properly pushed and planned enough, has the power of becoming another Google.



# Different Models

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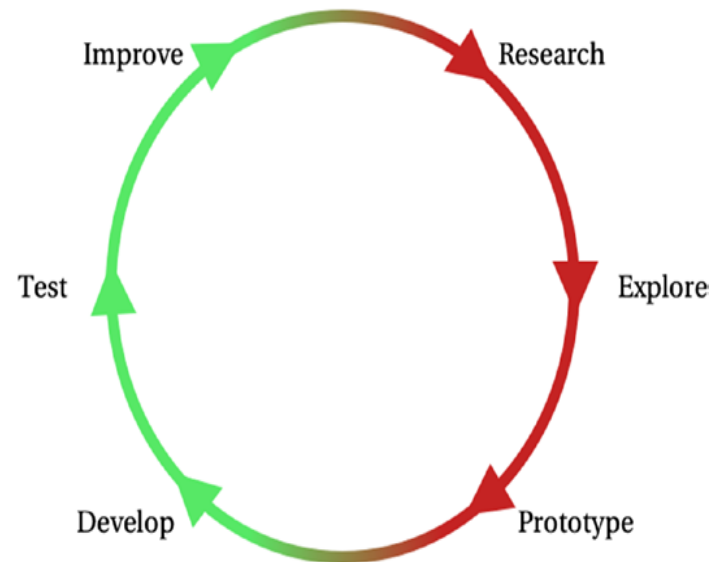
- ❑ Products that satisfy needs of individual customers are called **B2C** (business to consumer)
- ❑ While those that satisfy needs of other businesses are called **B2B** (business to business).
- ❑ **G2B** (government to business), **B2G** (business to government), even **C2C** (consumer to consumer). In this model the product facilitates the customers to provide services or sell products to other customers.

How do you decide what your product should do and what type of needs it should target in the first place? Run a research.

# Research and Development Process Lifecycle

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- ❑ There are different ways of saying “Research and Development.” “R-and-D,” “Rn’D,” “R&D,” “R+D,” or even “RTD ” (Research and Technological Development)—these terms are all the same.
- ❑ The amount (in percentage) of what a company invests in R&D is called **R&D intensity**.
- ❑ How does the process look like? It’s a cycle. Research, explore, prototype, develop, test, improve, research, explore... Repeat these actions forever because your product will never be perfect!



# Example of Research and Development

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- ❑ The analytics **dashboard** is built by business analysis experts on top of live metrics gathered from the running system in production.
- ❑ These **metrics** are being constantly discussed in weekly meetings by all the **stakeholders**.
- ❑ During these meetings, we think of **possible solutions** that will improve the number of existing metrics as we also come up with **new metrics to measure our success**.
- ❑ Based on these discussions, **sometimes new ideas are born, opening a way to new business opportunities**.

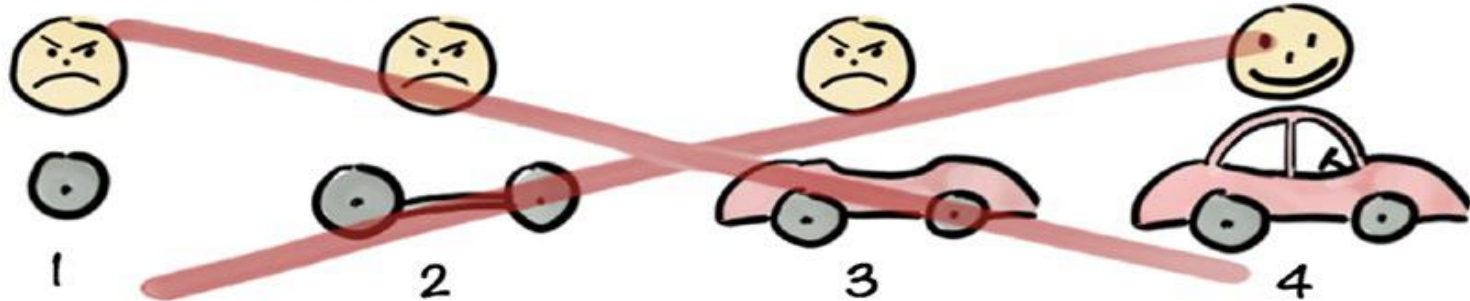
# Lessons Learned - Part2

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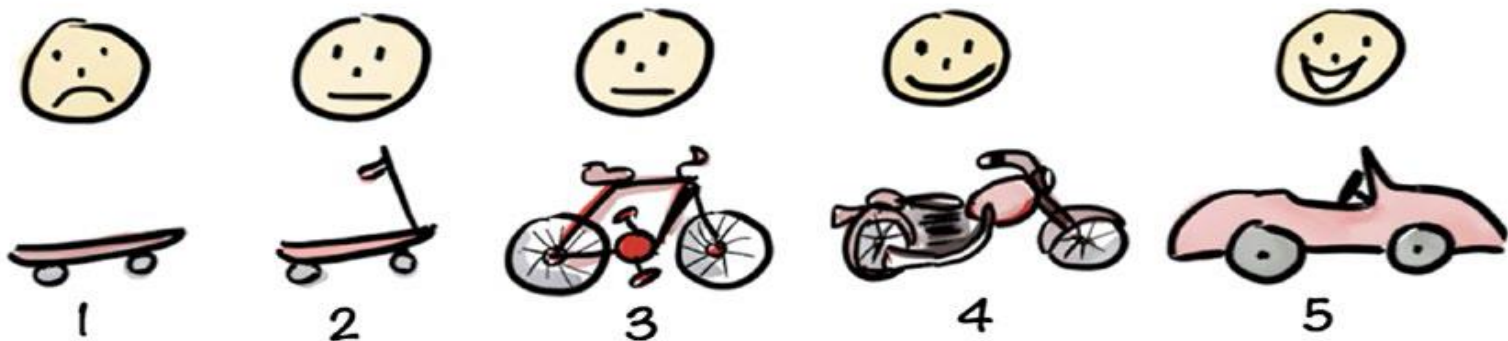
- ❑ It's not as easy as someone [just lying under a tree](#) and waiting for an apple to fall on their head.
- ❑ In today's [fast-changing](#) and highly competitive technological world, there must be some organizational structure that leads to the generation of ideas for new products or even ideas to improve the existing ones, making them attractive in the market.
- ❑ In fact, some companies have quite big [Research and Development departments](#).
- ❑ The world evolves every day; people change as well as their needs. [Things that are relevant today can be completely obsolete tomorrow](#).
- ❑ The idea of [building a new in-house platform](#) was born a long time ago.
- ❑ There was no R&D involved, no apple falling on our heads, no waking up in the morning with sudden enlightenment. Just struggling with an existing third-party platform lead to the idea of "[Let's create our own!](#)"
- ❑ You can try to [build a solid system](#) that will allow us to [easily add different features](#) and improve the existing functionality while being scalable and maintainable. For this we need to understand that we want to build a very basic first version of a product. In business, such a version is called an MVP.

# Famous illustration by Henrik Kniberg about MVP

Not like this....



Like this!



by Henrik Kniberg

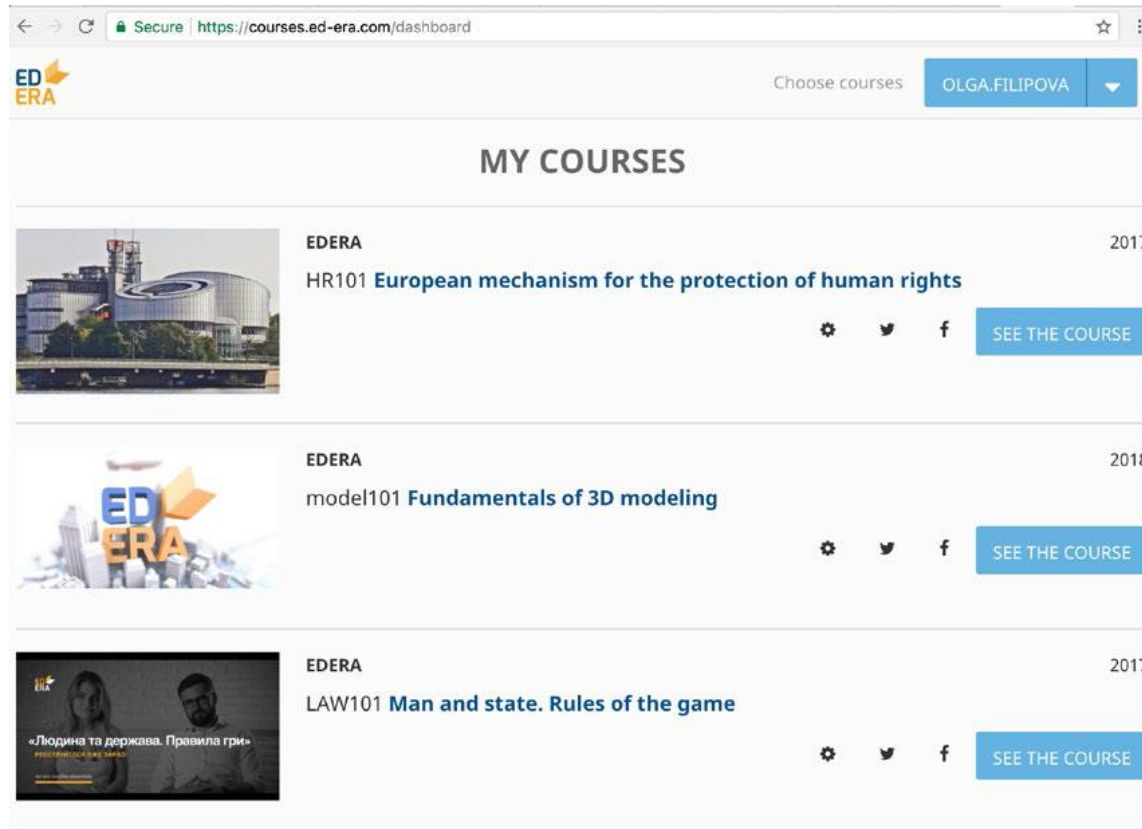
# Minimum Viable Product (MVP)

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- ☐ Have you ever heard the phrase, “We need to build a skate first”? People often say it exactly in a context applied to MVP
- ☐ This process is slower, but you have something working at every iteration.
- ☐ It is a product that has enough features to prove its concept.
- ☐ It also allows one to build features on top of it.
- ☐ It's good enough to be shown to the investors and to ask money for its development.
- ☐ It's good enough to use it in a basic way.

# Self-hosted Open edX platform: EdEra courses dashboard

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# Self-hosted Open edX platform: EdEra courses dashboard Cont.

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- ❑ At EdEra (an online education company that we represent as technical co-founders), R&D is run by a dedicated person.
- ❑ As a result, from these studies we got a huge amount of blog articles about gamification, adaptive learning, micro-learning, personalization, online learning, blended learning, mixed learning, etc.
- ❑ They offers a vast range of possibilities for creating and running MOOCs (Massive Open Online Courses). We are happy users of this platform, but...
- ❑ Different databases, message queues, programming languages, and technologies are bound together, offering a huge tightly coupled system difficult to scale horizontally, maintain, and upgrade.



# Overall Aims of Course

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- ❑ With this book we are going to build our skate for our learning platform.
- ❑ What is an MVP for a learning platform?
  
- ❑ Well, the learning platform has to offer a way to learn, right? Hence, we get to write a list of basic things required for someone to be able to learn.
- ❑ The online learning process usually consists of two simple stages:
  - There's some material to consume the knowledge (it can be a video, or a book, or just a piece of text),
  - And, there's a way to check the acquired knowledge (it can be a quiz, a test, a list of questions or some peer-to-peer assessment in more complex environments).

# Thank You

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