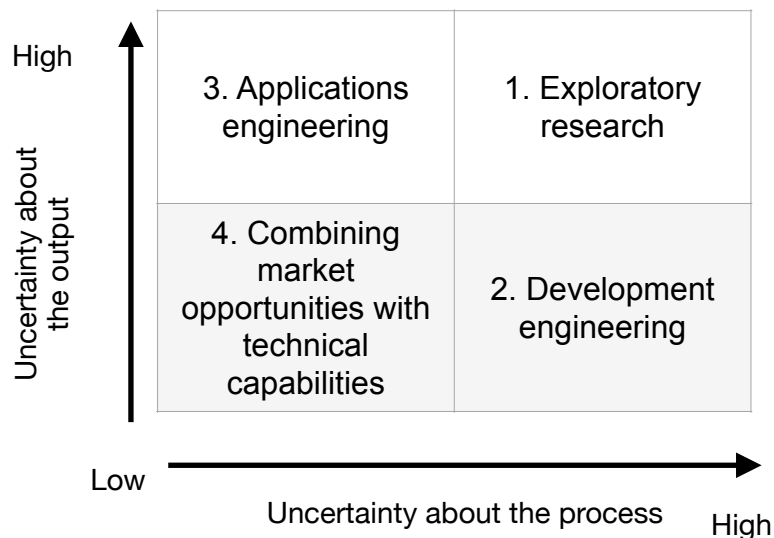


Q1.

- a) Pearson's Uncertainty Map is framework consisting of 4 quadrants and 2 axis representing 2 key aspects of framework. The X-axis refers to uncertainty about the process should be followed to achieve set aim. While Y-axis refers to uncertainty about the output to be more specific what is a target of a project. Based on uncertainty levels a relative quadrant with action is recommended to be performed.



- b) Quadrant 1: Exploratory research implies equal involvement of both technical and commercial managers since neither output nor process is clear in this case. An example is Xerox company that in 1970s developed software technology for computer graphical interface as part of its blue sky research(Paul Trott, page 82), however, it was discontinued as management did not identify possible benefits of this technology. Perhaps if more technical managers were present in the development process Xerox would be able to take advantage of that.

Quadrant 2: An example of Development engineering can be development of google glasses. Initially before product launch Google once identified how proposed product solves customer needs and wants have been investing in research on how to produce that kind of glasses. For Google it is recommended to form small teams with primary technical specialities to work on possible process to produce Google glasses. Moreover, team members with project management skills should participate in the development in order to identify when a project should be supported, encouraged to deliver or cancelled to avoid costs

Quadrant 3: An example of application engineering can be seen apple ClickWheel concept. The idea was to replace multi-touch interaction between user and smartphone with wheel control. Although Apple knew how to develop such element and already had prototype still they didn't find a proper application to it since it was providing poor performance for customer desiring to have free interaction. At this stage it is recommended

to keep team of technology manager and market focused employees, that will determine which markets to enter with identified technology.

Quadrant 4: In Combining market opportunities with technical capabilities stage a nice example new Apple Mac computer presented is since Apple has established production and developed new M1 chip and market opportunity since Apple is already presented in many markets and new Mac has much better performance, new look contributing to high sales since competitors don't have any relevant alternative for now. New product contains an application of new invention and its successful delivery to market that is called innovation. A recommended action is to bring the product to market as soon as possible since the presentation is made in order to be first with new product while no competitive alternative developed. Also for this stage recommend to keep the team of product and market focused managers that should forecast the market and capture market opportunities.

Q2.

a) Product Architecture refers to scheme describing arrangement of functional elements of the product into physical components and these components interaction with each other.

Main difference between Modular and Integral Architectures can be determined through functionality components are carrying on. In Modular each component is carry on one or few functions by itself. A good example of such design is Google's Project Ara, attempt to create a smartphone consisting of easily replaceable independent components. Each components had its own functionality provided: camera module, display module, etc.

On the other hand Integral architecture is one where a components may provide various functionalities or a functionality is supported by various components. An example can be a car's engine. Car's engine's main functionality is to give a drive to car, but it is also used to heat car inside(Relates to non-electric engines) since internal combustion engine produces a lot of heat.

b) Three type of Modular design are:

Slot-modular one where each component's interface to connect with entire product is of different type, so one component cannot replace other,

Bus-modular one where each component is connected to a common bus through same type of interface,

Sectional-modular one where components have same interface but are connected to each other directly instead of connecting to one module like in bus-modular.

The implication in terms of Product change is that modular design enables modification of product though changing various components but still not affecting much to other components functionality. By this any upgrade or adaption of product can be easily realised. Moreover, modular design facilitates reusability of components in other products as well by this allowing to easily change product and provide rich product line.

Q3.

- a) Intellectual property, known as IP or IPR, is an intangible asset created by human intellectual or inspirational activity. Design patent is one protecting unique visual features and other kinds of ornaments on it in case of Adidas proposed product. With patent Adidas will be granted a monopoly on production of those shoes for nearest 20 years by this others cannot make legal use of it without Adidas's agreement. Also It will ensure that the return on investment will go to Adidas, allow the company to commercially exploit the patent or charge other firms like Puma to use their patent. If Adidas for some reason will not have the resources to fully exploit it, the company will not lose out on this. Finally patent allows Adidas to become a market leader and gain image of innovator and first entrant to market since Patent will block others to copy technology.

Registered design can also help the Loop. Registered design will help Adidas to gain exclusive rights for up to 15 years in relation to appearance, physical shape, configuration and decoration. If the design patent is not obtained because the product is not sufficiently novel the registered design can still protect the Loop's visual appearance. The registered design is still capable of protecting the fact that the design is made from one material only, which seems to be the main novelty in this product that Adidas might consider protecting.

b) Barriers include:

- Patents require specific amount of money to be paid.
- Adidas will have to defend the Loop if there is any infringement, which can be costly and requires initiation from the company since government does not automatically protect patents.
- Registering a patent is a time-consuming process that may take months.
- Finally patent commission may not consider Loop as to be novel or have some novel features to be patented. Therefore Adidas might have to spend its resources in order to prove novelty of Loop.

c) Strategies:

- Do not patent
- Register it as registered design
- Plant patent - register materials used
- Trademark - associate the design with the trademark
- Trade secret - take advantage of trade secret by using such tools like non disclosure agreements
- Keep it a secret without legal enforcement

Q4.

- a) Core technology base is one that is central to most of companies products. In given case core technology can be seen software basis since googles products are high based on software reused from product to product. But from Leviss's perspective it will

be the material of jacket being produced and used in other products as well but not Jacquard-enabled

Complementary technologies are those that are important for production of stated product. In given case it can be either development IDE for google or sewing machines for Levis since it is used to make jackets regardless to Levis product and include Levi's Commuter Trucker Jacket.

Peripheral technologies are those that once applied are contributing to the business. In given example it will be a mobile application that acts more like an add-on to the whole product. Since idea of jacket is interaction with smartphone without using the screen therefore mobile app may act only for settings of jacket sensors.

Emerging technologies are referring to those adding long-term significance to product. In current case it is the Jacquard-enabled fabric enabling gesture control over phone and can become a revolutionary to the way people interact with gadgets. In long-term it is going to be the main technology around which entire industry maybe formed and it is core innovation in proposed product.

- b) External R&D is outsourcing entire R&D as well as contracting or creating alliances with other firms and their R&D. Need for external R&D can be explained with lack of Levis's expertise in gesture or software technologies while Google lacks experience in jacket production. External R&D allows these firms to support each other for new product development.
- c) Competitors expenditures and investment in R&D, Organisations growth objective for long-term period, Need for stability, Distortion that large projects may introduce.
- d)
 - 1. Inter-firm comparisons - refers to comparing amount allocated by other firms and considering on amount we should spend.
 - 2. Fixed relationship to turnover - we set a specific percentage of turnover to be spend on R&D.
 - 3. Fixed relationship to profit - we set a specific percentage of profit to be spend on R&D.
 - 4. Reference to previous levels of expenditure - we identify expenditure based on previous statements.
 - 5. Costing of an agreed programme - based on amount needed for project without specific limits.
 - 6. Internal customer-contractor relationship - based on amount required by external firm that conducts R&D for us if R&D is outsourced.