BAHRIA UNIVERSITY, (Karachi Campus)

Department of Software Engineering

Assignment 3 - Spring 2022

COURSE TITLE:	Engineering Management	COURSE CODE: **MGT-423**	
Class:	**BSE-IV (B)**	Shift: **Morning**	
Course Instructor:	**ENGR. TALHA BIN SAEED**	Time Allowed:	**1 Week**
Submission Date:	**08/06/2022**	Max. Marks:05	

[CLO4: 5 Marks]

QUESTION #01

Evaluate the R&D process that is required to develop a better product?

M Muaz Shahzad 02-131202-081

Solution

R&D is critical for future growth and maintaining a market-relevant product.

R&D, or research and development, is the process through which a corporation seeks out fresh information that it can use to produce new technologies, goods, services, or systems that it can use or sell. The most common aim is to improve the company's bottom line.

Types of research

- Most research is either fundamental or applied. Basic research aids in the acquisition of new knowledge for the organisation, although it has no specific application or purpose in mind. Consider it research only for the sake of research.

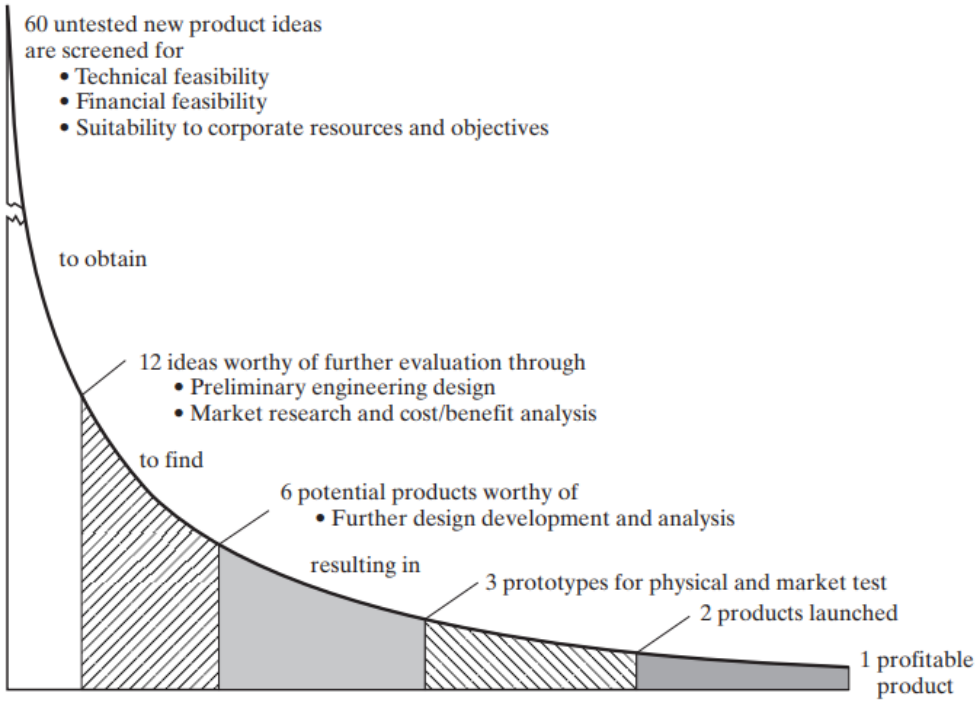
- Applied research, like basic research, is done with a specific purpose, use, or product in mind, such as how to make a better mousetrap.

Development

The methodical application of scientific knowledge to the creation of usable materials, technologies, systems, or procedures, including the design and development of prototypes and processes, is known as development.

Any successful technology-based manufacturing company will have far more research project ideas than funds to fund them. According to Booz, Allen, and Hamilton, Inc., the following ratio of new product ideas to successful products is about right.

- Sixty ideas (from researchers, other workers, consumers, and suppliers) must be promptly whittled down to
- Twelve concepts deserving of preliminary technical study and profitability analysis, to generate
- Six defined prospective products worth further development, to acquire
- Three prototypes for physical and commercial testing, which resulted in
- Two products with full-scale manufacturing and marketing commitments, one of which is
- At least one product should be a commercial success.



Screening in R&D process

After the formation of ideas, the new product development process moves on to screening (or concepts). It is typically based on personal experience and market research, and it employs scoring models, checklists, and personal judgments.

Making R&D Organizations Successful

Three topics are treated herein:

1. the relation of R&D strategy to business strategy
2. evaluating the effectiveness of R&D (both at the organizational and individual levels)
3. and providing effective support for researchers.

Organizational Effectiveness.

Balderston et al. suggest the following 11 criteria for business enterprise R&D:

1. Ratio of research costs to profits
2. Percentage of total earnings due to new products
3. Share of market due to new products (usually computed as the volume of sales from a firm's new products in a specific product market to the total sales available from that market, which confounds the measure by including marketing proficiency as well)
4. Research costs related to increases in sales
5. Research costs to ratio of new and old sales
6. Research costs per employee
7. Ratio of research costs to overhead expenses such as administrative and selling costs
8. Cash flows (continuing evaluation of the pattern of outflows for research expense and actual and projected inflows from resulting revenue)

9. Research audits, including indicators of administrative and technical objectives such as costs, time, completion dates, probability of technical success, probability of commercial success, expected market share, expected profits, expected return on investment, design, and development. Blake provides a checklist of questions to ask in such an audit.
10. Weighted averages of costs and objectives (a measure of the extent the average R&D dollar contributed toward objectives with weights on a scale, such as 0.0 equals project badly missed objectives to 3.0 equals project far exceeded objectives)
11. Project profiles (a more complex weighted scoring of each project, using criteria such as those in the research audits, item 9).

Individual Effectiveness.

Individual researchers' effectiveness can be assessed using the standard performance assessment procedures discussed in Chapter 7, particularly management by objectives (MBO), which focuses on research objectives. A few quantitative measurements, such as the number of patents and publications, as well as citations of those articles by others, provide only a limited insight into the success of research.

Support for R&D

1. Quality supporting services need to be supplied to make the work of the highly trained scientist and engineer more efficient and productive. A few special types of assistance that are needed in research and engineering are listed as follows:
2. Technician support to carry out repetitive testing and other functions not requiring a graduate engineer or scientist
3. Shop support of mechanics, glassblowers, and carpenters to produce test and research equipment based on researchers' sketches
4. A technical library with technical information specialists conversant in the fields of the company's interest and willing and able to suggest sources to researchers, and structure and run searches in the appropriate databases for them
5. Technical publication support, including typing, editing, and graphical support to simplify researchers' production of reports, technical papers, and presentations
6. A flexible, responsive system for approving and acquiring equipment as needed by researchers
7. Ample computer facilities conveniently available to researchers, and programming assistance to provide consultation and programming to those researchers not wishing to do it themselves
8. A strong internal commercialization process in place to take research to produce

Sources:

[1] Investopedia. 2022. Why Research and Development (R&D) Matters. [online] Available at: <https://www.investopedia.com/terms/r/randd.asp> [Accessed 4 June 2022].

[2] business, S., generator, B., maker, L., name, D., photography, S., sell, P., themes, S., everywhere, S., Instagram, F., Marketplace, W., business, M., marketing, E., automation, M., groups, C., chat, B., Ads, F., everything, M., Pay, S., Protection, F., automation, E., in, L., Center, H., Courses, B., Community, S., tools, F., encyclopedia, B., Events, C., in, L., Articles, L., Idea?, N., Products, S., Store, S., Marketing, S., Stories, F. and Updates, P., 2022. What is Research and Development (R&D)? Definition and Guide. [online] Shopify. Available at: <https://www.shopify.com/blog/what-is-research-and-development#:~:text=Research%20and%20development%20%E2%80%93%20R%26D%20%E2%80%93%20is, to%20the%20company's%20bottom%20line.> [Accessed 4 June 2022].

[3] Cleverism. 2022. Research and Development (R&D) | Overview & Process. [online] Available at: <https://www.cleverism.com/rd-research-and-development-overview-process/> [Accessed 4 June 2022].

[4] 2022. What is the R&D Process? (With pictures). [online] Available at: <https://www.wise-geek.com/what-is-the-rd-process.htm> [Accessed 4 June 2022].

[5] Vistage Research Center. 2022. New Product Development Process: The Role of Design, R&D, And More | Vistage. [online] Available at: <https://www.vistage.com/research-center/business-leadership/business-innovation/new-product-development-process-role-design-rd/> [Accessed 7 June 2022].