

### 1.1 What is a Product?

A product is a material tangible or intangible that can be offered to the consumer for a fee. A tangible material is a material that can be physically presented to the consumer to touch. An example is the different types of detergents available in the market. e.g. OMO, SURF etc.. An intangible material is a material which cannot be physically presented to a consumer to touch e.g. services provided by an insurer of a house, car and health insurance.

### 1.2. Why Do We Need A Product?

Human beings always have a need for activities of daily living like washing the mouth every morning, taking the bath daily, eating everyday etc. to survive. There are other activities that humans do that are not activities of a daily living but still needs to do them. For example, insuring the car, health, life or collating the account of a business. All these activities require different products to be able to do them. Therefore, it can be concluded that the activities of humans necessitate the requirement of a product either tangible or intangible

### 1.3. New Product Development

**New product development (NPD)** is the complete process of bringing a new product to market. NPD is described as the transformation of a market opportunity into a product available for sale<sup>1</sup> and it can be tangible (that is, something physical you can touch and feel) or intangible (non - physical item that you feel touch and feel like a service, experience, or belief). One needs to have a good understanding of customer needs and wants, the competitive environment and the nature of the market. These are the top required factors for the success of a new product.<sup>1</sup> Cost, time and quality are the main variables that drive the customer needs. By focusing on these three variables, companies develop continuous practices and strategies to better satisfy the customer requirements and increase their market share by a regular development of new products. There are many unknowns and challenges throughout the process faced by the companies. The use of best practices and the elimination of barriers to communication are the main concerns for the management of NPD process<sup>1</sup>.

Most industry leaders see new product development as a *proactive* process where resources are allocated to identify market changes and seize upon new product opportunities before they occur (in contrast to a *reactive strategy* in which nothing is done until problems occur or the competitor introduces an innovation). Many industry leaders see new product development as an ongoing process (referred to as *continuous development*) in which the entire organization is always looking for opportunities.

Great amounts of uncertainty and change may exist which makes it difficult or impossible to plan the complete project before starting it. In this case, a more flexible approach may be advisable.

Because the NPD process typically requires both engineering and marketing expertise, cross-functional teams approach are always used to organize the projects.<sup>2</sup> The team is responsible for

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all aspects of the project, from initial idea generation to final commercialization, and they usually report to senior management (often to a vice president or Program Manager). In those industries where products are technically complex, development research is typically expensive and product life cycles are relatively short, strategic alliances among several organizations helps to spread the costs, provide access to a wider skill set and speeds up the overall process. Because both engineering and marketing expertise are usually critical to the process, choosing an appropriate blend of the two is important. A new product pricing process is important to reduce risk and increase confidence in the pricing and marketing decisions to be made.

**The path to developing successful new products<sup>3</sup>** is guided by three key processes that play a critical role in product development: Talk to the customer; Nurture a project culture; Keep it focused and simple.

## Chapter 2

### 2.1 Process structure

The product development process typically consists of several activities employed by the company in the process of presenting new products to the market. Every new product will pass through stages of

(i) **Ideation or Fuzzy front-end (FFE)** is the set of activities employed before the formal and well defined requirements specification is completed. Requirements are a high-level view of *what* the product should do to meet the perceived market or business need. Good models have been proposed for this stage. Peter Koen et al. developed a five-step front-end activity called **front-end innovation** that includes: opportunity identification, opportunity analysis, idea genesis, idea selection, and idea and technology development. At the middle of the five-stage processes is a step that can influence the process outcome which is the management that drives the activities described. The front end of the innovation is the greatest area of weakness in the NPD process because it is often chaotic, unpredictable and unstructured<sup>4</sup> The design stage is the stage where most of the product life cycle costs are engaged. Research have shown that 70% - 80% of the final product quality and 70% of the product entire life-cycle cost are at this stage and represent the greatest opportunity for cost reduction<sup>5</sup> The duration of this stage varies. It may last for months or years before it is concluded<sup>8</sup>. Design and Commercialization phases usually start a very early collaboration. When the design is finished it will be sent to manufacturing plant for prototyping.

### 2.2 The Marketing Challenges of New Product Development

A number of approaches have been proposed for analyzing and responding to the marketing challenges of new product development. These include the eight step approach of Koen<sup>6</sup>. The steps include:

1. **Idea Generation** also called the "NPD" of the NPD process<sup>6</sup>
  - Ideas for new products can be obtained from basic research using a **SWOT analysis** (Strengths, Weaknesses, Opportunities and Threats). Market and consumer trends, company's R&D department, competitors, focus groups, employees, salespeople, corporate spies, trade shows, or ethnographic discovery methods (searching for user patterns and habits) may also be used to get an insight into new product lines or product features.
  - Lots of ideas may be generated about a new product. Out of these ideas many are implemented. The ideas are generated in many forms. Many reasons are responsible for generation of an idea.
  - Idea for new product can come from sources, such as customer, scientists, competitors, employees, channel member, and top management.
  - Customer need and wants are the logical place to start the search.
  - Idea Generation or Brainstorming of new product, service, or store concepts - idea generation techniques can begin when you have done your OPPORTUNITY ANALYSIS to support your ideas in the **Idea Screening Phase**

**2. Idea Screening**

- The object is to eliminate unsound concepts prior to devoting resources to them.
- The screener should ask several questions:
  - Will the customer in the target market benefit from the product?
  - What is the size and growth forecasts of the market segment / target market?
  - What is the current or expected competitive pressure for the product idea?
  - What are the industry sales and market trends the product idea is based on?
  - Is it technically feasible to manufacture the product?
  - Will the product be profitable when manufactured and delivered to the customer at the target price?

**3. Idea Development and Testing**

- Develop the marketing and engineering details
- **Product Idea** - It is an idea for a possible product that the company can offer the market.
- **Product Concept** - It is a detailed version of the idea stated in meaningful consumer terms.
- **Product Image** - It is the way consumers perceive an actual or potential product.
  - Investigate intellectual property issues and search patent databases
  - Who is the target market and who is the decision maker in the purchasing process?
  - What product features must the product incorporate?
  - What benefits will the product provide?
  - How will consumers react to the product?
  - How will the product be produced most cost effectively?
  - Prove feasibility through virtual computer aided rendering and rapid prototyping
  - What will it cost to produce it?
  - Testing the Idea may involve asking a number of prospective customers to evaluate the idea

**4. Business Analysis**

- Estimate likely selling price based upon competition and customer feedback
- Estimate sales volume based upon size of market
- Estimate profitability and break-even point

**5. Beta Testing and Market Testing**

- Produce a physical prototype or mock-up
- Test the product (and its packaging) in typical usage situations
- Conduct focus group customer interviews or introduce at trade show
- Make adjustments where necessary
- Produce an initial run of the product and sell it in a test market area to determine customer acceptance

**6. Technical Implementation**

- New program initiation
- Finalize Quality management system
- Resource estimation

- Requirement publication
  - Publish technical communications such as data sheets
  - Engineering operations planning
  - Department scheduling
  - Supplier collaboration
  - Logistics plan
  - Resource plan publication
  - Program review and monitoring
  - Contingencies - what-if planning
7. **Commercialization** (often considered post-NPD)
- Launch the product
  - Produce and place advertisements and other promotions
  - Fill the distribution pipeline with product
  - Critical path analysis is most useful at this stage
8. **New Product Pricing**
- Impact of new product on the entire product portfolio
  - Value Analysis (internal & external)
  - Competition and alternative competitive technologies
  - Differing value segments (price, value and need)
  - Product Costs (fixed & variable)
  - Forecast of unit volumes, revenue, and profit

These steps may be done one at a time, eliminated, and many steps may be completed at the same time or skipping some.

In summary the product development will have the following four steps:

(ii) **Product design:** this is the development of both the high-level and detailed-level design of the product: which forms the *fundamental* requirements into a specific requirements of *how* this particular product will meet those requirements.

(iii) **Product implementation and manufacturing:** this is the phase of detailed engineering design of soft goods or other product forms, as well as of any test process that may be used to validate that the prototype objects actually meet the design specification and the requirements specification that was previously agreed to.

(iv) **Market Introduction or Fuzzy back-end or commercialization phase:** this is the action steps where the production and market launch occur

## Chapter 3 Other Models to New Product Development

### 3.1 IDEO and BAH Process

Alternative models to NPD have been developed like the IDEO and BAH process. The IDEO model is a five-step procedure<sup>7</sup> these steps are as follows:

1. Understand and observe the market, the client, the technology, and the limitations of the problem;
2. Synthesize the information collected at the first step;
3. Visualize new customers using the product;
4. Prototype, evaluate and improve the concept;
5. Implementation of design changes which are associated with more technologically advanced procedures and therefore this step will require more time.

The BAH process was developed by Booz, Allen and Hamilton in 1982<sup>8</sup> This is the best known model because it underlies the NPD systems that have been put forward later.<sup>9</sup> The model represent the foundation of all the other models that have been developed afterwards. Significant work has been conducted in order to propose better models, but in fact these models can be easily linked to BAH model. The seven steps of BAH model are: new product strategy, idea generation, screening and evaluation, business analysis, development, testing, and commercialization.

Other authors have divided pre-development product development activities differently:<sup>10</sup> The following approach has been suggested

1. Preliminary
2. Technical assessment
3. Source-of-supply assessment: suppliers and partners or alliances
4. Market research: market size and segmentation analysis, VoC (voice of the customer) research
5. Product idea testing
6. Customer value assessment
7. Product definition
8. Business and financial analysis

These activities yield essential information to make a Go/No-Go to Development decision.

One of the earliest<sup>1</sup> studies using the case study method defined the front-end to include the interrelated activities of<sup>11</sup>

- product strategy formulation and communication
- opportunity identification and assessment
- idea generation
- product definition
- project planning
- executive reviews

Economic analysis, benchmarking of competitive products and modeling and prototyping are also important activities during the front-end activities. The outcomes of FFE are the:

- mission statement
- customer needs
- details of the selected idea
- product definition and specifications
- economic analysis of the product
- the development schedule
- project staffing and the budget
- a business plan aligned with corporate strategy

### 3.3 Model of Fuzzy Front-End Process (FFE)

A conceptual model of Front-End Process was proposed which includes early phases of the innovation process. This model is structured in three phases and three gates:<sup>12</sup>

- Phase 1: Environmental screening or opportunity identification stage in which external changes will be analyzed and translated into potential business opportunities.
- Phase 2: Preliminary definition of an idea or concept.
- Phase 3: Detailed product, project or service definition, and Business planning.

The gates are:

- Opportunity screening
- Idea evaluation
- Go/No-Go for development

The final gate leads to a dedicated new product development project. Many professionals and academics consider that the general features of Fuzzy Front End (fuzziness, ambiguity, and uncertainty) make it difficult to see the FFE as a structured process, but rather as a set of interdependent activities (Kim and Wilemon, 2002)<sup>13</sup> However, Husig et al., 2003<sup>14</sup> argue that front-end not need to be fuzzy, but can be handled in a structured manner. In fact, Carbone<sup>15</sup> showed that when using the front end success factors in an integrated process, product success is increased. Peter Koen<sup>16</sup> argues that in the FFE for incremental, platform and radical projects, three separate strategies and processes are typically involved<sup>16</sup> The traditional Stage Gate (TM) process was designed for incremental product development, namely for a single product. The FFE for developing a new platform must start out with a strategic vision of where the company wants to develop products and this will lead to a family of products. Projects for breakthrough products start out with a similar strategic vision, but are associated with technologies which require new discoveries.

Incremental, platform and breakthrough products include:<sup>16</sup>

- *Incremental products* are considered to be cost reductions, improvements to existing product lines, additions to existing platforms and repositioning of existing products introduced in markets.

- *Breakthrough products* are new to the company or new to the world and offer a 5-10 times or greater improvement in performance combined with a 30-50% or greater reduction in costs.
- *Platform products* establish a basic architecture for a next generation product or process and are substantially larger in scope and resources than incremental projects.

### 3.3 Margaret Rouse Concept<sup>17</sup>

Product development, also called new product management, is a series of steps that includes the conceptualization, design, development and marketing of newly created or newly rebranded goods or services. The objective of product development is to cultivate, maintain and increase a company's market share by satisfying a consumer demand. Not every product will appeal to every customer or client base, so defining the target market for a product is a critical component that must take place early in the product development process. Quantitative market research should be conducted at all phases of the design process, including before the product or service is conceived, while the product is being designed and after the product has been launched.

### Product development frameworks

Product development is creative science; the process requires a systematic guide to get a new product to market. A framework helps structure the actual product development.

Some frameworks, like the fuzzy front end (FFE) approach, define what steps should be followed, but leave it up to the team to decide which order makes most sense for the specific product that is being developed. The five elements of FFE product development are:

**Identification of design criteria** -- involves brainstorming possible new products. Once an idea has been identified as a prospective product, a more formal product development strategy can be applied. Companies must take a holistic approach to managing this process and must continue to innovate and develop new products if they want to grow and prosper.

- CUSTOMER CENTERED New Product Development. Focuses on:
  - Finding new ways to solve customer problems.
  - Create more customer-satisfying experience

Companies often rely on technology, but the real success comes from understanding customer needs and values.

The most successful companies were the ones that:

- Differentiated from others
- Solved major customer problems
- Offered a compelling customer value proposition
- Engaged customer directly
- TEAM BASED New Product Development
  - An approach:
  - To designing new products in which various company's departments work closely together overlapping the steps in the product development process in order to:



- Save time
  - Increase effectiveness
  - Company departments work closely together in cross functional teams overlapping the steps in the product development process (to save time and increase effectiveness).
  - Those departments are: legal, marketing, finances, design and manufacturing, suppliers and customer companies.
  - If there is a problem, all the company can work.
- **SYSTEMATIC New Product Development**
  - Development process should be holistic (alternative) and systematic not to good ideas die.
  - This process is installed on Innovation Management System that collect, review, evaluate new product ideas and manage
    - the company appoints to a senior person to be the Innovation Manager who encourage all the company
    - employees, suppliers, distributors and dealers to become involved in finding and developing new products.
  - Then, there is a Cross-Functional Innovation Management Committee which:
    - Evaluate new products ideas
    - Help bringing good ideas
  - To sum up, New-Product success requires:
  - New ways to create valued customer experience, from generating and screening new product ideas to create and roll out want-satisfying products.
- **New Product Development IN TURBULENT TIMES**
  - When we are in a tough economic situation usually management reduces spending on: new-product development. Usually it is done from a short-sighted.
  - Though times might call for even:
    - Greater new-product development, offering changing customer needs and tastes.
    - Innovation helps
    - Making the company more competitive
    - Positioning it better for future.
- **Virtual Product Development**
  - Uses collaboration technology to remove need for co-located teams
  - Reduces G&A overhead costs of consulting firms
  - Advent of 24-hour development cycle

### 3.3 Hyper-converged infrastructures: Game changer or vendor push?

**Idea analysis** -- involves a closer evaluation of the product concept. Market research and concept studies are undertaken to determine if the idea is feasible or within a relevant business context to the company or to the consumer.

**Concept genesis** -- involves turning an identified product opportunity into a tangible concept.

**Prototyping** -- involves creating a rapid prototype for a product concept that has been determined to have business relevance and value. Prototyping in this front-end context means a "quick-and-dirty" model is created, rather than the refined product model that will be tested and marketed later on.

**Product development** -- involves ensuring the concept has passed muster and has been determined to make business sense and have business value.

Other frameworks, like design thinking, have iterative steps that are designed to be followed in a particular order to promote creativity and collaboration. The five components of design thinking are:

**Empathize** -- Learn more about the problem from multiple perspectives.

**Define** -- Identify the scope and true nature of the problem.

**Ideate** -- Brainstorm solutions to the problem.

**Prototype** -- Weed out unworkable or impractical solutions.

**Test** -- Solicit feedback.

This composite new product development (NPD) framework for manufactured goods has eight important components:

**Idea generation** is the continuous and systematic quest for new product opportunities, including updating or changing an existing product.

**Idea screening** takes the less attractive, infeasible and unwanted product ideas out of the running. Unsuitable ideas should be determined through objective consideration.

**Concept development and testing** is vital. The internal, objective analysis of step two is replaced by customer opinion in this stage. The idea, or product concept at this point, must be tested on a true customer base. The testers' reactions can then be leveraged to adjust and further develop the concept according to the feedback.

**Market strategy/business analysis** is comprised of four P's, which are product, price, promotion and placement.

Product: The service or good that's been designed to satisfy the demand of a target audience.

Price: Pricing decisions affect everything; profit margins, supply and demand, and market strategy.

**Promotion:** The goals of promotion are to present the product to the target audience, increasing demand by doing so, and to illustrate the value of the product. Promotion includes advertisements, public relations and marketing campaigns.

**Placement:** The transaction may not occur on the web, but in today's digital economy, the customer is generally engaged and converted on the internet. Whether the product will be provided in bricks-and-mortar or clicks-and-mortar shops, or available through an Omni-channel approach, the optimal channel, or channels, for placement must be determined if the targeted potential customers are to become actual customers.

**Feasibility analysis/study** yields information that is critical to the product's success. It entails organizing private groups that will test a beta version, or prototype, of the product, then evaluate the experience in a test panel. This feedback communicates the target market's level of interest and desired product features, as well as determines whether the product in development has the potential to be profitable, attainable and viable for the company, while satisfying a real demand from the target market.

**Product technical design/Product development** integrates the results of the feasibility analyses and feedback from beta tests from stage five into the product. This stage consists of turning that prototype or concept into a workable market offering; ironing out the technicalities of the product; and alerting and organizing the departments involved with the product launch, such as research and development, finance, marketing, production or operations.

**Test marketing, or market testing,** differs from concept or beta testing in that the prototype product and whole proposed marketing plan, not individual segments, are evaluated. The goal of this stage is to validate the entire concept -- from marketing angle and message to packaging to advertising to distribution. By testing the entire package before launch, the company can vet the reception of the product before a full go-to-market investment is made.

**Market entry/commercialization** is the stage in which the product is introduced to the target market. All the data obtained throughout the previous seven stages of this approach are used to produce, market and distribute the final product to and through the appropriate channels.

Product development is an always-evolving and fluid process, and just as some steps will change, depending on the nature of the project, so will the person who manages product development. In some organizations, there is a dedicated team that researches and tests new products. Some smaller organizations may outsource their new product development to a design team. In midsize organizations, the product manager is often the person in charge of product development, and he or she may be part of the marketing team, while tech shops selling B2B products and services that have very technical requirements may have their product managers report to engineering. Regardless of what framework is used and who is in charge of new product development, the *new* part is just one aspect of the entire product lifecycle management

## Chapter 4 Common Sense Approach to New Product Development<sup>18</sup>

It's not enough to run nascent products by friends and family. Instead, vet early-stage plans and prototypes with potential customers (in other words, strangers).

The idea is to get people to tell you whether the product meets their needs and, if not, what might improve it. Is the product the right shape? Are buttons or other functional components in the right place? Is it the right color? Does it perform the way people want it to?

This is what Kit Hickey does with Ministry of Supply, the performance-apparel company she co-founded in 2011. Based in the Boston area, Ministry of Supply often tests new clothing items by selling beta versions in small 10- to 100-item batches through its website and collecting customer feedback on color, fit, fabric and comfort. That way, "you're not spending weeks or months working on features that might not even matter to your customers," Hickey says.

### **2. Refine your design with simplicity in mind.**

A straightforward product design is essential. The same goes for brand continuity among every item you sell.

"Your product has to capture someone's attention within the first three seconds of them glancing at it," says Ziver Birg, founder of Zivelo, which sells customized electronic kiosks to banks, airports and retailers. In fact, the Phoenix-area entrepreneur says that quality design is the best investment you can make.

Product packaging should be clean and compelling as well, with easy-to-read text. Busy packaging that explodes with colors or design elements will only frustrate consumers.

"In most consumer product categories, packaging is your only communication with customers," says Shae Hong, CEO of Sensio, a small-appliance business headquartered in New York. "People need to know what you're selling from 30 feet away."

When developing packaging, consider where your product will be sold, advises Jeff Dahl, inventor of LoopRope, a bungee product for securing camping and outdoor gear. Retailers want packaging that won't take up too much space, and many are looking for eco-friendly options, says the Medford, Ore., entrepreneur, who learned this the hard way. "The cost of redoing it is not cheap," he says.

### **3. Don't skimp on materials or manufacturing.**

A low-cost vendor isn't necessarily your best bet. "It's important not to make purchasing decisions based solely on price," Ko says. "You have to go for quality and reputation." That may mean spending a little extra, given that top-shelf suppliers, labs and manufacturers tend to charge more.

Look online, attend trade shows and collect industry recommendations. You may need to hire an agent to find a factory for you. However, Ko cautions, you must personally visit any factory you're thinking of partnering with, even if it's 8,000 miles away.

To ensure that production is up to snuff, create guidelines for every manufacturing detail.

“It's not enough to outline 85 percent of the process,” Hong says. For example, don't simply say that your product should be constructed of stainless steel—specify a grade, or the factory will likely use the lowest-end option.

Don't expect a flawless product off the bat, and stay on top of every detail. “You have to check that,” says Amy Wenslow, CEO of Products to Profits, a consultancy in Pasadena, Calif., that helps entrepreneurs develop, market and sell their products at stores such as Walmart, Target, Lowe's, Bed Bath & Beyond and Big 5 Sporting Goods. “It's like a Grand Canyon-size cliff if you don't. Because that's your opportunity to sign off that your product is correct, and if it's not, to have the production line stop and fix it.”

#### **4. Price it right.**

Many entrepreneurs fail to factor in all overhead costs—including shipping and duties—when considering pricing. Other mistakes: gauging incorrectly what consumers will be willing to pay, not knowing where you want to sell the product and thinking you can make the same profit margin from high- and low-end retailers. For example, selling at Nordstrom will yield a different margin than selling on Amazon and may require different packaging, Wenslow says.

Wait to do the math until you've nailed down all the particulars. Once you run the numbers, if your profit margins are too low (or the price you need to charge to make a profit is too high), you may need to whittle down your manufacturing costs.

Hong is a fan of looking to the marketplace—at comparable products and industry margins—to calculate product price. “I've always been a big believer that your cost and the price is driven by the market, unless you are creating a new market for a product,” he says.

If you need help setting prices, Wenslow suggests enlisting the services of a product development consultant or sales broker.

#### **5. Don't overstock.**

Sure, you don't want to run out of product. And sure, suppliers offer discounts for larger orders. But tying up all your capital in inventory can turn your company into the Titanic. “If you think you're going to sell 100 pieces, don't go and buy 1,000,” Ko says. Instead, buy 110.

Cash flow, shipping time, storage space and shelf life will dictate how much product you stock. “It's an intricate dance, and every industry is different,” Ko says.

Then there's the matter of how many colors, styles, sizes and other variations to initially offer. Again, fewer are better. Give consumers too many options, and you risk overwhelming them. "There's that old adage," Wenslow says, "A confused mind won't buy."

### **6. Protect your ideas.**

Intellectual property laws can protect you only if you arm yourself accordingly. Hiring a tough IP attorney is a must. But before you shell out thousands, visit the U.S. Patent and Trademark Office website ([uspto.gov](http://uspto.gov)) to learn about these protections and ensure that your idea hasn't already been patented or trademarked by someone else.

As early as possible, you should trademark your product name, purchase the corresponding web domain and file a provisional patent application, which won't break the bank but will allow you to stake a claim on your idea while giving you a year to file a formal application.

You probably won't be able to afford to patent your products in multiple countries from day one—you'll likely file a U.S. patent first and add others as it makes sense. But it helps to determine early on where else you may want to market your idea, Wenslow says, because once you head down this path, the deadlines for filing patents abroad arrive quickly.

### **7. Consider retailers and communicate wisely.**

Landed a meeting with a potential retailer? You need to anticipate all questions they might lob your way so you can help them see how to market and sell your product to their particular customer base. "It's all about specificity," says Zivelo's Birg.

Keep your pitch simple. For Birg, the most effective pitches relay three concise, memorable selling points for potential buyers. "I have to put myself in their shoes and know that they report to someone," he explains. "You don't want your presentation to be overly complex."

You may not get into your preferred retail outlet your first time out. If that's the case, be persistent but pleasant. Dahl, whose products now sell on QVC and through retailers such as Camping World and Cabela's, follows up once per month or quarter with buyers he's met who are still on the fence.

Be wary of diving into the big-box pool too soon—you need high profit margins to do so. Many retail chains will demand that you carry a hefty liability insurance policy and provide display boxes or fixtures for your products. "You have to spend money to make money," Ko points out. "And you have to make sure you have enough to spend."

## **Chapter 5 New Product Developments in a University Research Environment in Africa**

### **5.1 The University Environment**

Environment of universities are a little different from the environment in the western world. In the western world the following situations are obtained

1. The universities are either private or public institutions
2. There slush of research grant available to researchers either from government agencies, companies or private individuals
3. The universities and the companies work together
4. The universities are seen as the extension of the companies
5. Every year the nation budget money for research
6. Collaborative work is thriving
7. Regional and national conferences are available every month
8. Trade shows for every discipline is scheduled at regular intervals
9. Intellectual property documents are available from the onset so that everybody knows its share in any new product developed
10. Competition drives development
11. Spiritual matters are separated from education
12. Positive attitudes towards one nation
13. Society is very open
14. Venture capitals seeking for new products are very much available
15. Atmosphere for development is thriving
16. Analytical tools for the scientist are available
17. Well-structured welfare package for the researchers
18. Researchers are accountable for honesty and trust in finances and research outcomes.
19. Issues of plagiarism are minimal
20. Unemployment is very minimal

### **5.2 The African University Environment**

The environment in an African university is radically different from that of the western world. The following situations exist in its settings:

1. The universities are either private or public institutions

2. There are paucity of research grants available to researchers either from government agencies, companies or private individuals, so therefore researches are run with personal money from the researchers income
3. The universities and the companies do not work together
4. The universities are not seen as the extension of the companies
5. Every year the nation does not budget money for research
6. Collaborative work is next to nothing
7. Regional and national conferences are rarely available
8. Trade shows for every discipline is not scheduled at regularly
9. Intellectual property documents are scarcely available from the onset nobody knows its share if any new product developed
10. Competition is almost nil
11. Spiritual matters are interwoven with education and the society in general
12. Negative attitudes towards one nation
13. Society is very closed
14. Venture capitals are rarely available
15. Atmosphere for development is nil
16. Analytical tools for the scientist are rarely available
17. No well-structured welfare package for the researchers
18. Researchers are forced to be accountable for honesty and trust in finances and research outcomes.
19. Issues of plagiarism are high
20. Unemployment is very rampant which makes student to have choice disciplines to study. This then leads to unequal development of the society.

All these factors lead to stress on the researcher and therefore will limit them from reaching the greatest potential

### **5.3 New Product Development in an African University**

Most companies in Africa are multinationals and they have their research laboratories based in their home countries. This makes the idea of new product development non-existing.

If there is any new product at all, the effort is based on individual effort, spending and marketing.

There are no structured systems that nurtures or encourage product development. The new product development process in Africa usually is a one man show and follows the following steps:

1. An idea occurred to a researcher or recognizes an opportunity
2. Experiment on it and produce few products
3. Test the product among friends, relatives and co-worker in order to make the product better



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4. Borrow money from friends and relatives to start production on a small scale
5. Crudely package the product and start producing it on a small scale
6. Start selling it in local markets
7. Rarely patent the product before introducing it to the market
8. Recently will obtain a product number for a government agency (NAFDAC)
9. Occasionally might get support from international agents or government banks to start production

### Chapter 6 Case Studies

#### Case 1

Mr. Oluwaseyi is a chemist attending a school chapel seminar at Babcock University. The topic of discussion at the seminar is about eating healthy food. It was identified during the talk that most snacks available on campus for both students and staff are not that nutritious and healthy. There was a call for the school scientist to produce healthy and nutritious food choices for the school community

#### Case 2

At the same school same, refreshing drinks available on campus are the common soda drinks like, Fanta, Sprite, Pepsi which are highly sugar laden drinks. These drinks because of the high sugar content are not healthy. Fruit juices are not common even when available, have high sugar contents. There was a suggestion to find locally available alternative drinks for the campus community

#### Case 3

Single honors science discipline like chemistry, biology, physics, mathematics etc, are not attractive to many students. Develop a product mix that will be attractive to students and make them up for these disciplines?

#### Case 4

Babcock University is thinking of offering a health insurance policy for its staff and academics  
Develop an health insurance product for the school?

#### Case 5

A new commercial farm outfit is thinking of providing wealth for its worker and thought of arranging a wealth policy and mandate for them. Suggest a mandate and policy for such a program

#### Case 6

The university is thinking of ways to encourage research activities on its campus. Develop a policy package that will encourage this?

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