

# Introduction to Development of Operations Management

2019-01-24

## Glossary

**Fixed Position Layout** Moving the material around the labour, instead of the opposite, to minimise motion.

**Operations Management** The activity of Managing the resources devoted to the production & delivery of products and services.

**Pure Products/services** Outputs that are exclusively tangible/intangible

**Mixture of Products & Services** Mixture of tangible/intangible

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Operations Management is one of the three functions, Marketing, Finance and Operations of any organisation. We want to know how goods/services are produced. It needs to be known what operations managers do. Departments such as Marketing, HR or Finance rely on Operations, as it provides necessary building blocks, products/services. Because of the actual producing the product taking place within the Operations Department, it is often the most costly Department. Operations in consideration to contribution should be looked at in comparison to an increase in sales or decrease in finance. Quality Management and Service/Product design are critical decisions of Operations Management.

## The Critical Decisions

Process and capacity design as well as Location, in terms of what processes will products require, what equipment/technology is necessary? The Layout needs to be designed, how should it be arranged from inside? Supply Chain Management & Material planning (OVERHAUL)

## OM Jobs

- Plant Management

- Purchasing Director
- Supply Chain Management

E.g. Athanassios

## REVISE SUPPORT FUNCTIONS AIDING Operations Management

### Interfunctional relationships between operations and other functions

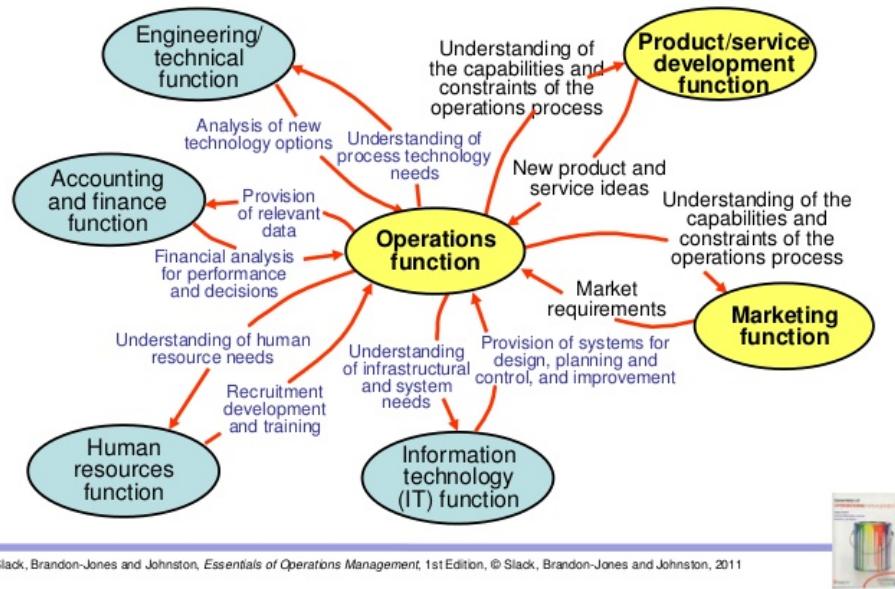


Figure 1: Relationships between operations and other functions

### Heritage of Operations Management

*La cherché pour l'optimisatio continuelle.* **Eli Whitney** landed a 10,000 musket contract with the Government in 1798. He showed that machine tools could make standardised parts to exact specifications. The standardisation that came with Whitney allowed for more accurate planning and interchangeable parts to be substituted, thus making warfare less of a guessing game in terms of where musket rounds go, but more of a planning process in which bullets would travel. **Frederick W. Taylor**, known as *the father of Scientific Management*, was chief engineer at Midvale Steel, 1881, and studied how tasks were done. He was the first to use motion & time studies and further created efficiency principles. His drive to perceive his observations from a scientific standpoint, allowed him to observe tasks, split them into actions (motions over time) and chained these

actions to find out whether or not they can be made more efficient. Prior to Taylor, employees worked as they wanted to, now they had to follow principles, get training and use specific tools in order for efficiency increases.

In the past the man has been first; in the future the system must be first, the first object of any good system must be that of developing first class men. -*Frederik W. Taylor*

Taylor's work was continued by Fran & Lillian Gilbreth, an engineering couple that applied efficiency methods to their home operations and their twelve children for systematic management.

*The quest of the One Best Way Motion&Fatigue*

Henry Ford, first used moving assembly line to make the model T car under The Ford Motor Company 1913. The unfinished product would move by a conveyor belt past the working station, to minimise motion of labour, thus inventing *fixed position layout*. Furthermore, by minimising motion, he maximises productivity, lower cost, effectively lowering price, making it more accessible to the general public, shifting it from luxury good to normal. The *Organisation: Labour Control* is a cooperative project between Taylor and Ford. Taylorism for the Ford employees meant dividing the process up into repetitive tasks, hundreds for a car. He could, by having more profits, give out more pay, which kept the employees at the cruel repetitive jobs and attracted even more to Detroit. Taylorism became a notorious term, due to the perception of the assembly line system to employees.

**W. Edwards Deming** Engineer and physicist, credited with teaching Japan quality control methods post WWII. He used statistics to analyse processes and let workers have involvement in the decisions about the process. His influence is still worshipped every year in Japan with the Deming award for innovative process.

*The activity of Managing the resources devoted to the production & delivery of products and services.*

## The Basic transformation Model

**Transformed resources** enter the production as something but exits it *transformed*, differently. **Transforming resources** are the facilities or staff that transform resources. These *input resources* in Operations Management undergo the functions of such, *direct, develop, deliver and design*. The output products and services are then passed on to the customer. E.g. University: students are the transformed resources, where the professor and aiding material such as beamer or computer are the transforming resources.

Consultancy service markets have their biggest share in OM

## Slack et al's model of operations management

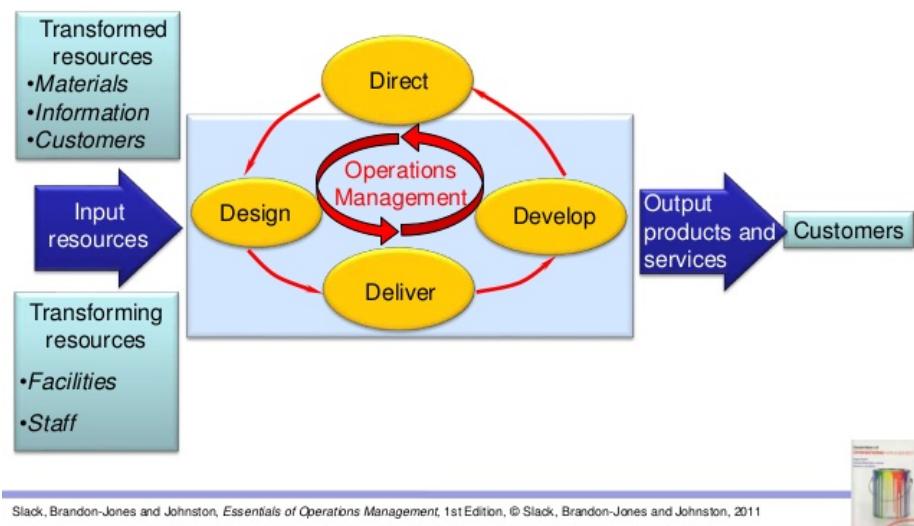


Figure 2: Essentials of Operations Management Model

## Operations management at..... IKEA



Figure 3: Operations Management at IKEA

Look at Operations Management at IKEA, the cost lowering achieved by having customers build their own furniture, not only saves money, but also enables other firms to use the training received indirectly from IKEA. An Air-Hunter, designed the packaging of IKEA's *flat-packed* furniture, effectively maximising used space. The flat-packaging also allowed customers to carry a whole Cabinet.

Pret-á-Manger has its standardisation embodied in staff versatility and value mixture. Their in-store food preparation saves logistics, while encompassing more complex labour. The supply chain is more transparent for the end-consumer. The flexibility that arises from such behaviour, allows Pret to change their Sandwich assortment within shortest time periods, due to trained staff to be versatile.

### Prêt a Manger



- “High-end” sandwich and snack retailer
- Use only “wholesome” ingredients
- All shops have own kitchens which makes fresh sandwiches every day
- Fresh ingredients delivered early every morning
- Same staff who serve you at lunch made the sandwiches that morning
- ***We don't work nights, we wear jeans, we party...***

Slack, Brandon-Jones and Johnston, *Essentials of Operations Management*, 1st Edition, © Slack, Brandon-Jones and Johnston, 2011



Figure 4: Prêt-a-Manger

## Products & Services within Operations

Most operations produce products and services, there are **pure products** and **pure services** and the mixture of both. The following depicts a product/service scale sorted list of Outputs.

- Crude Oil production - Only the oil is delivered
- Aluminium smelting - The aluminium has to be smelted in specification

## The three basic functions at Prêt à Manger

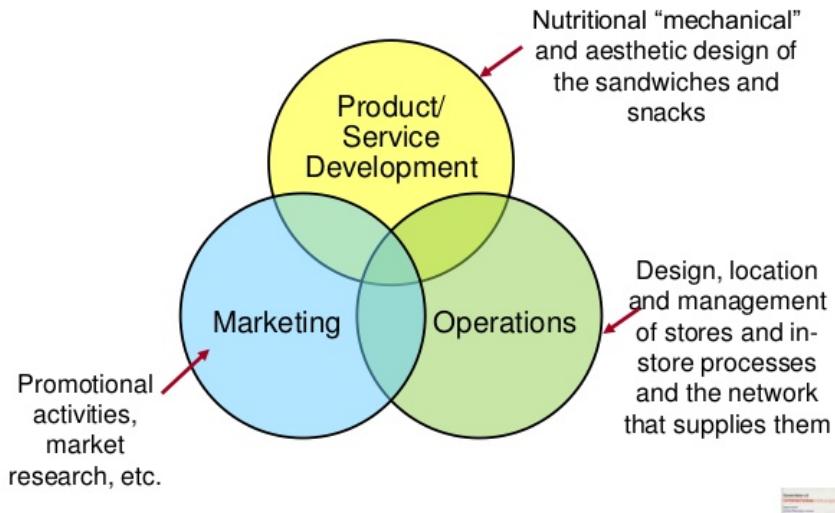


Figure 5: The Basic Function at Pret

- Specialist machine tool production - Usage must be taught
- Restaurant - There are significant service as well as product aspects.
- Psychologist Therapy - Purely intangible

### **Operations can be analysed on three levels**

The flow between operations is the **supply network** also known as the *Supply Chain*. It is the first level and is concerned with the flow of transformed resources between operations & processes. The second level is the level of *operation*, in which the flow between processes take place, such as cutting, painting, packaging. External operations interact with the internal processes to form the external supply network. The third level is the level of *process*, in which there is a flow between resources. Processes form an internal *supply network* and become each others customers and suppliers.

Operations Management is concerned with the flow of transformed resources between operations & processes, where External operations interact with the internal processes to form the external supply network. Processes form an internal *supply network* and become each others customers and suppliers.

All functions use processes to provide service. Every part of the organisation uses processes to produce products or services for external customers.

### **INSERT MISSING NOTES HERE**

### **What is strategy?**

Setting broad objectives that direct an enterprise towards its overall goal. Planning the path that will achieve these goals Dealing with the total picture rather than stressing individual activities.

### **Operations is not the same as operational.**

Operations are the resources that create products and services, which is very similar to strategic. Operational is the opposite of strategic, meaning day-to-day and detailed.

### **The Four V's**

**Volume**, how much output we produce. The higher the volume, the lower the periodic cost. More processes specialisation and economies of scale are the reason for the lower periodic cost. **Variety** is about how many different products/services we offer. The higher the variety, the higher the periodic cost.

In order to produce different products simultaneously, we need more equipment et cetera. **Variation** in demand. The higher the variation in demand, the higher the periodic cost. **Visibility**, how much the operation is visible to the customer or how much customer conduct there is. The higher the visibility, the higher the periodic cost as e.g. staff needs to be trained for better customer interactions or the decorations of the facilities.

### **Cost leadership & Differentiation**

Porter presented two methods / functions, cost leadership and differentiation. In Cost leadership, the competitive advantage comes from having the lowest production cost for a product/service. In differentiation the objective is to convince the customer that your product/service is different/special. It is less about being better, more about being different. Targeting a niche in the market, would be focused, opposite from differentiation.

### **How is operations strategy different to operations management?**

Operations management is short term focused, on the micro scale, concrete and detailed ("*Can we give tax services to the small business market in antwerp?*") where as operations strategy is long term, on the macro scale, philosophical and aggregated ("*What is our overall business capabilities compared with other capabilities?*").

### **The 4 stage model of operations contribution**

From the four stage model it can be seen how *IKEA* or *Pret's* operations support the strategies they implemented. *Dacia* for example could be in the second stage or the third stage, given they are a company with several years of strategy development and integration. First stage companies are normally unknown and to give example of these are rare, a shop down the street may be stage one. Stage one companies don't make it and thus they are not growing big enough in the first place to be known by anyone. Most operating companies are stage two, where as stage three companies are the best in the market of what they're doing. If supportive of a fourth stage existing, fourth stage companies redefine industry expectations and strategy is driving operations. An example could be *Apple*, that build the *iphone* because it could, not because it planned to. The capability to engineer the *iphone* was the driving force. The further up the stage, the increasing is the contribution of operations and the operations capabilities. Another example for stage four, redefining the industries they operate in, could be *Amazon*, which was not good at being a book store, as it started out, but became so much more, a company good at distribution and logistics, AI and

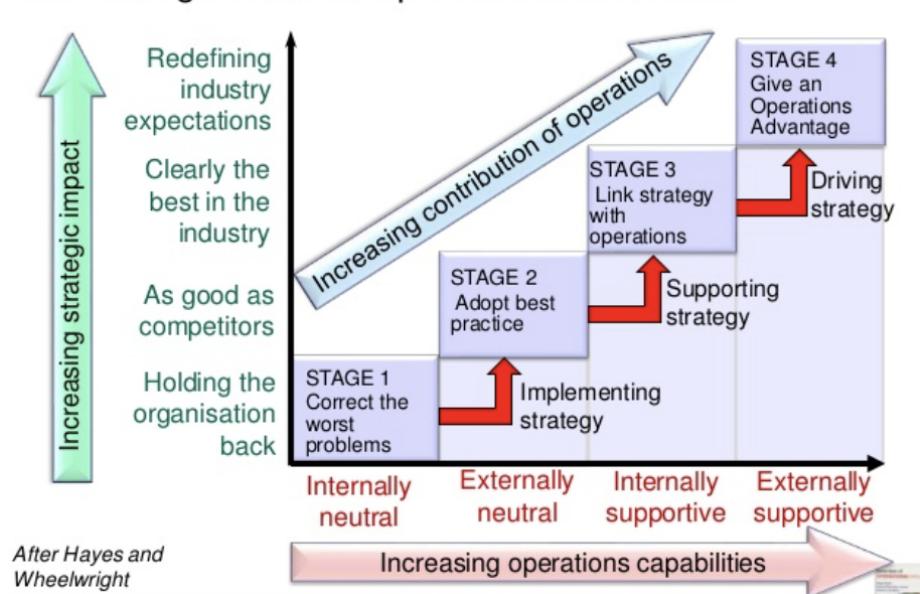


Figure 6: The 4 stage model of operations contribution

content delivery networking, they provide an online marketplace and connect sellers and buyers, deliver food with fresh and even open their own super markets. Amazon's strategy is to utilise what they are good at, providing dependable services, such as their delivery services (prime, supplier delivery).

### The four perspectives on operations strategy

*Top - down perspective* describes how operations are being commanded what to do by the business. *Bottom - up perspective* means improving on experience, knowing what product/service does well and focusing on that. E.g. Being a restaurant in which people often ask for take-away, should consider offering take-away service. *Market requirement perspective* describes that the e.g. product choice is depending on the market the firm is in. *Operations resources perspective* means that the operations will reduce what they cannot do and focus on what the business can do. E.g. A restaurant in which the customer orders something, the approach of doing what the client wants would be *market requirement perspective*, where as when the meal is prepared and chosen by the cook, it would be a *operations resources perspective*. E.g. Apple telling customers what they want and need in a product, as they often do is an *operations resources perspective*.



Figure 7: The four perspectives on operations strategy

### Top - Down Bottom - Up perspectives of strategy

#### The strategy hierarchy

In the Corporate strategy creation, PESTEL is probably a good method framework. For Business strategy formation, Porter's five forces could be used. For Functional strategy formation SWOT is the most fitting tool.

#### Order-winning

Qualifying and less important competitive factors

As I improve my performance competitive benefit increases.

E.g. Safety for a car is a qualifying factor. Further improvements in performance will result in diminished competitive benefit. The qualifying threshold has to be met, but exceeding does not improve competitive benefit. E.g. earning five safety stars makes a big difference to one star, but having ten stars (*imaginary*) won't help. A Hotel not changing the bed sheets will not qualify, thus have a minimal competitive benefit, though changing the sheets more than ten times a day will not be necessary.

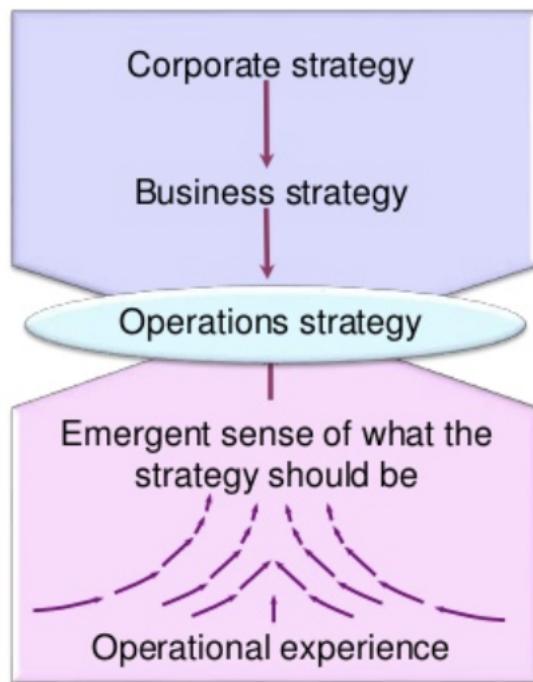


Figure 8: Top - Down Bottom - Up perspectives of strategy

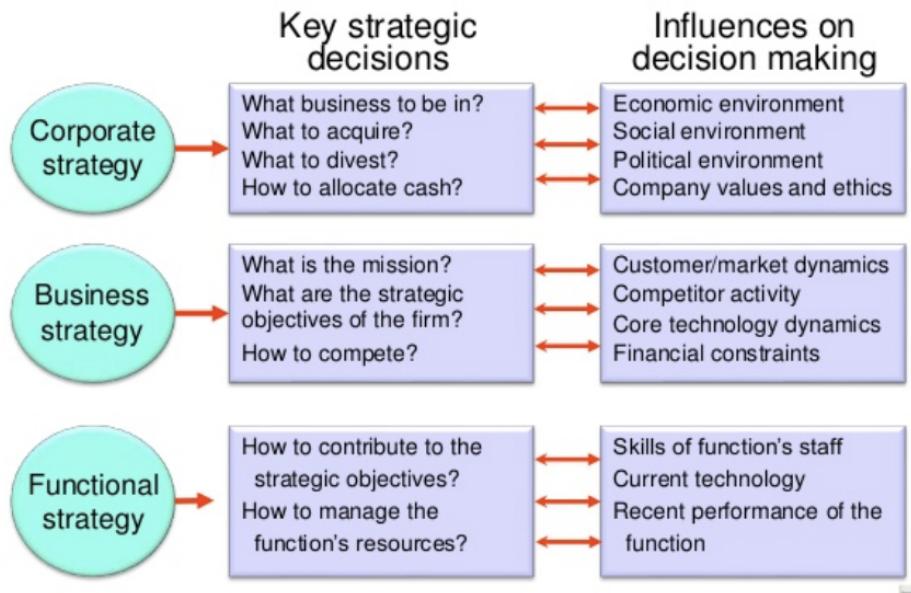


Figure 9: The strategy hierarchy

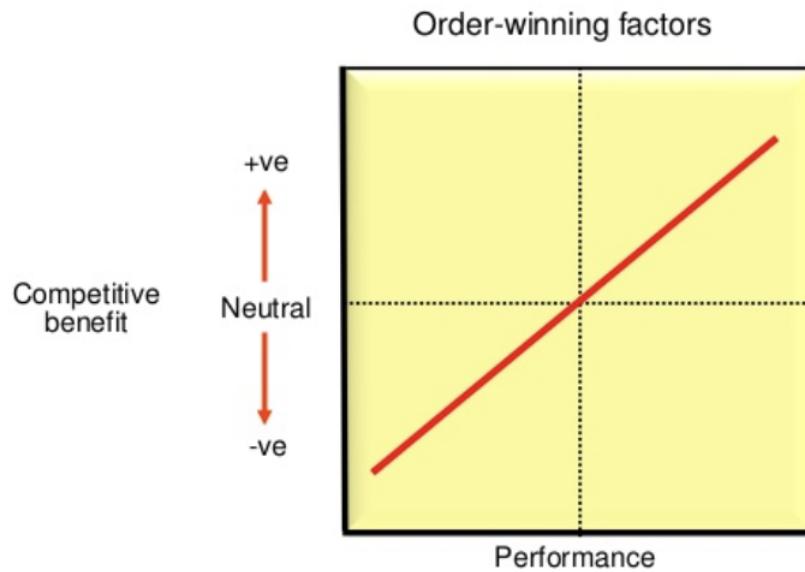


Figure 10: Order-winning Factors

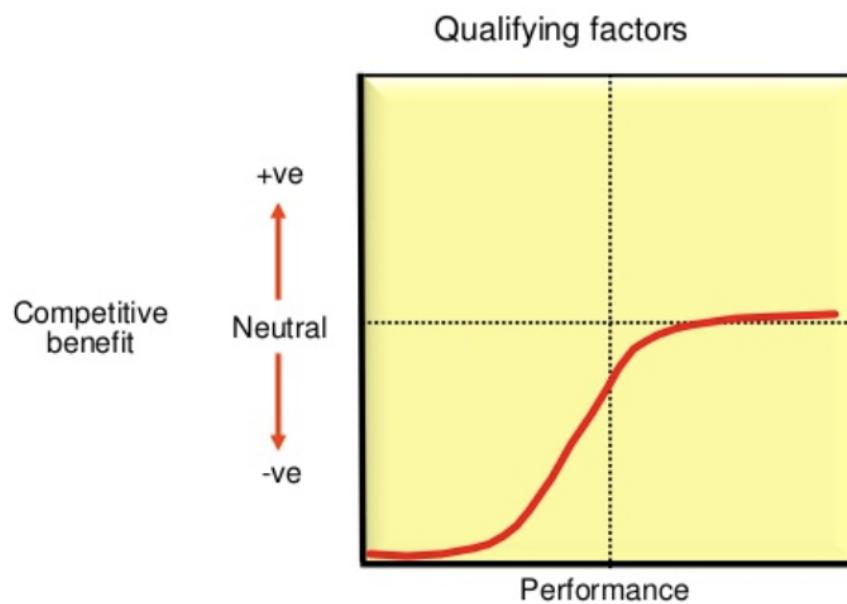


Figure 11: Qualifying Factors

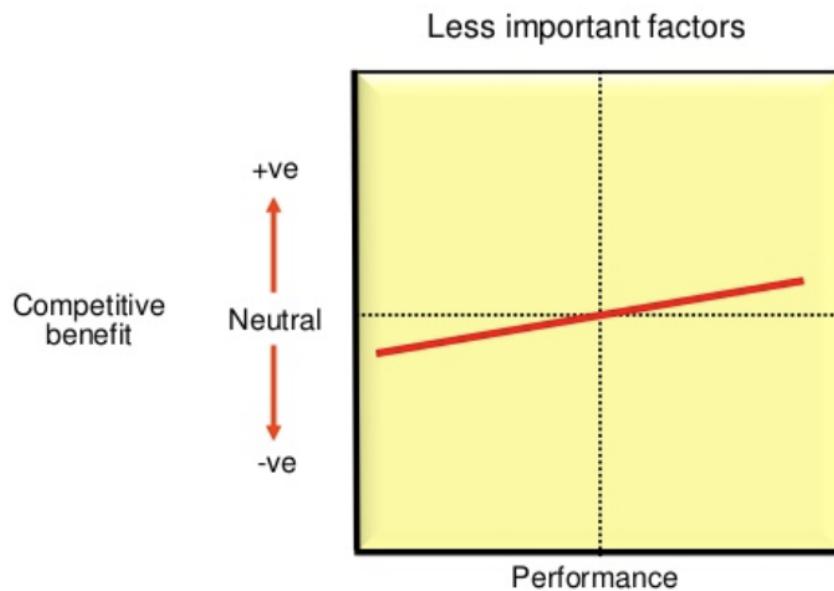


Figure 12: Less important factors

E.g. A university and the cantine inside or the car having a heated steering wheel. These factors are not vital and have diminished impact on competitive benefit overall.

### The effects of the product/service life cycle

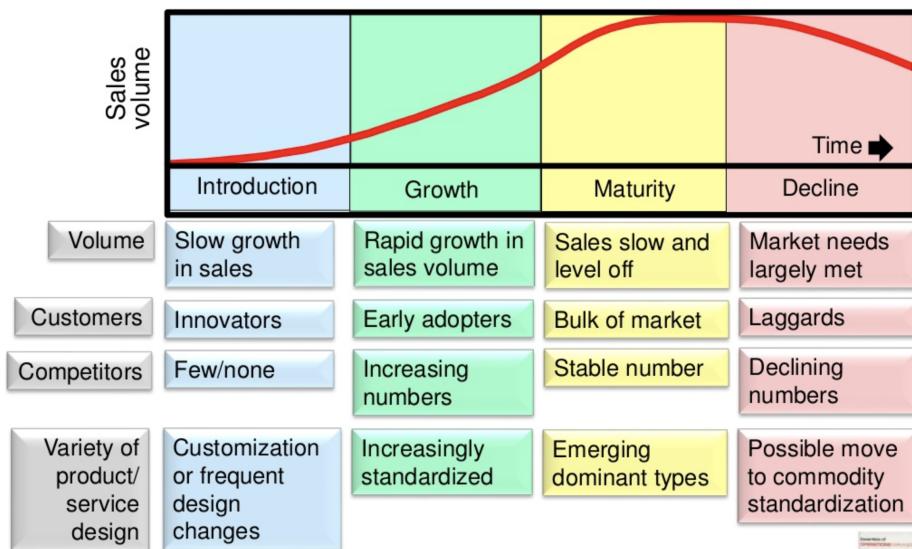


Figure 13: The effects of the product/service life cycle

It can be seen in the figures above, how the different stages of the product life have different objectives to fulfill. We look at different aspects, given what stage the product/service is in. E.g. in the growth stage we look at the availability and quality of the product/service to fulfill the expectation of the product to the mass market.

### Different competitive factors imply different performance objectives

If the customer asks for low price, the objective should be to reduce cost, whereas if the customer demands high-quality, that's what they should be given. E.g. Apple providing innovative products and services, what the customers want, by being flexible. Flexibility allows different thought processes to occur, thus enabling innovation to happen more likely.

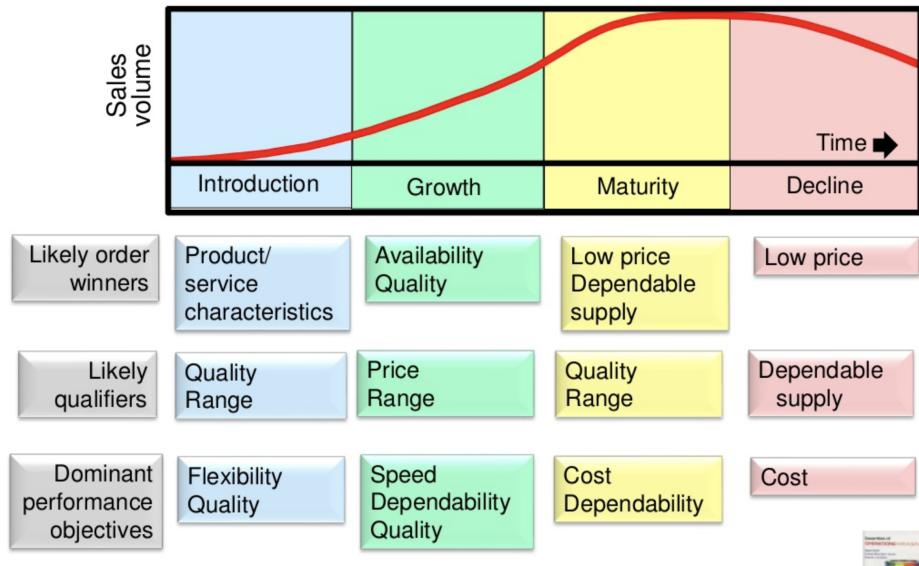


Figure 14: The effects of the product/service life cycle

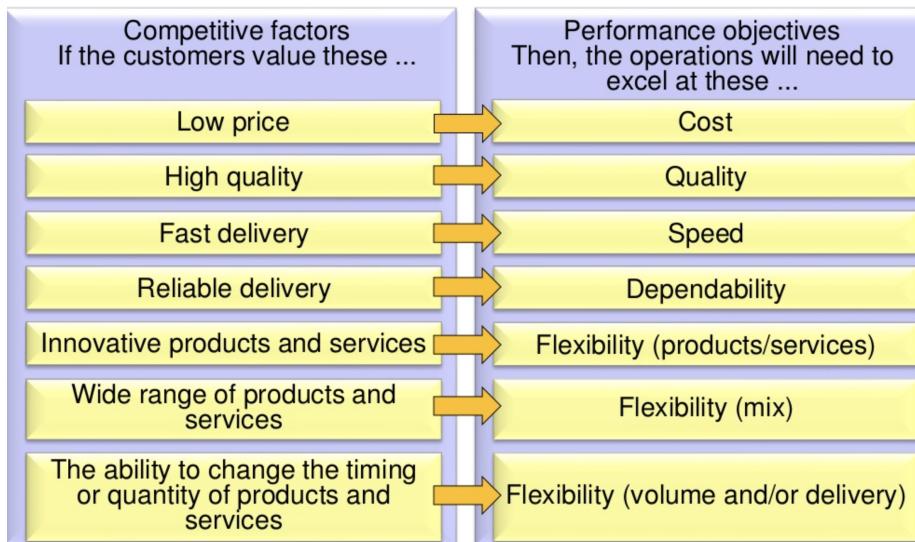


Figure 15: Different competitive factors imply different performance objectives

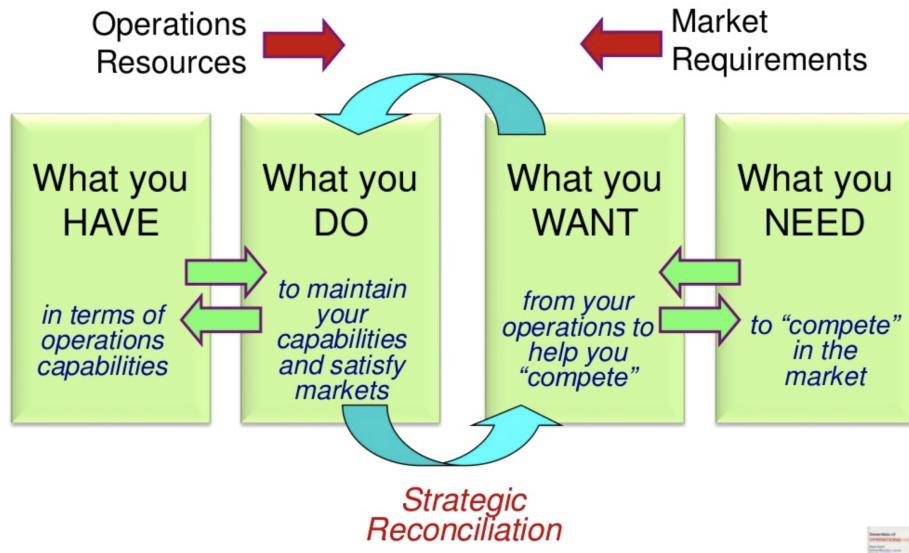


Figure 16: Strategic Reconciliation

### Strategic Reconciliation

#### *Mintzberg's concept of emergent strategy*

#### The triple bottom line

E.g. When choosing plastics for packaging, there is a negative impact upon the environment, accounted for in the *Planet* aspect of the triple bottom line. Recyclability of materials, energy, consumption, waste material generation and the reduction of transport-related energy as well as noise pollution, fume and emission pollution count towards the *Planet*. Obsolescence and wastage, Environmental impact of process failures and Recovery to minimise impact of failures. The *People* aspect includes customer safety from products and services, employment impact of an operation's location, employment implications of outsourcing, the repetitive or alienating work done and staff safety in the workplace as well as non-exploitation of developing country suppliers. The *Profit* aspect includes the cost of producing products and services, the revenue from the effects of quality, speed, dependability and flexibility as well as Effectiveness of investment in operations resources or Risk and resilience of supply count towards *Profit*. Lastly, it is building the capabilities for the future of the organisation.

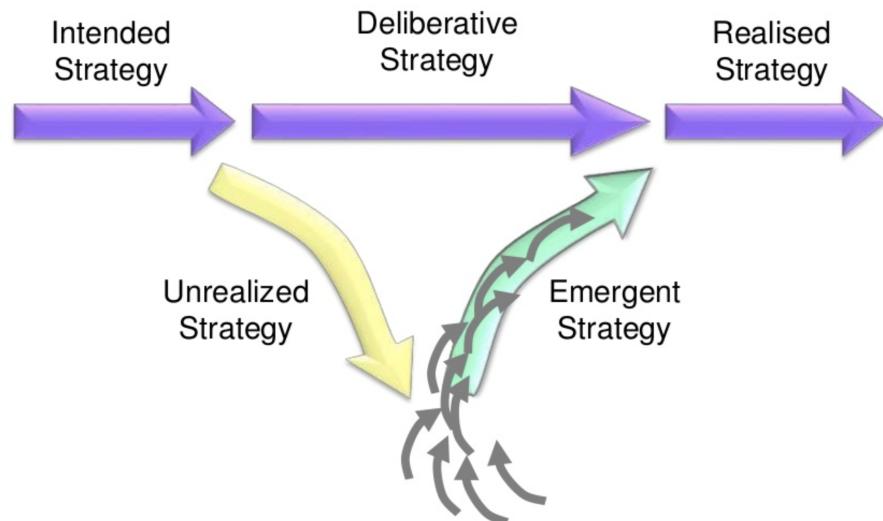


Figure 17: Mintzberg's concept of emergent strategy

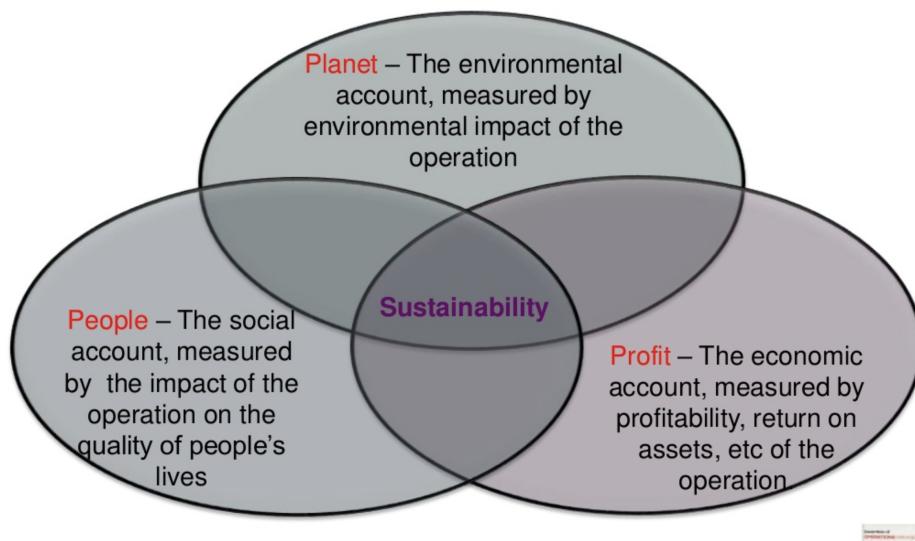


Figure 18: The triple bottom line

## Operations and process management contribution to strategy

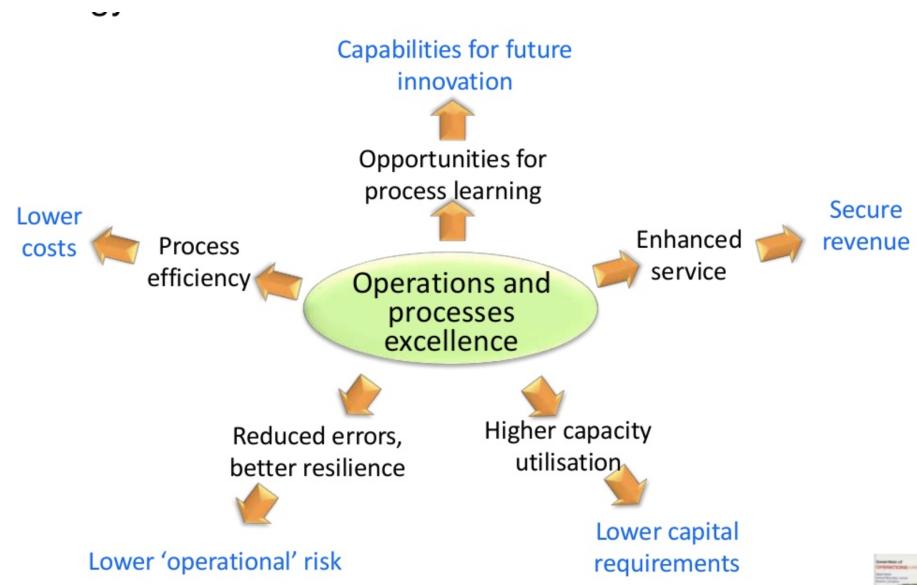


Figure 19: Operations and process management contribution to strategy

## The five competitive objectives

Quality is about being right. Speed is being fast. Dependability is being on time reliably. Flexibility is being able to change and adapt. Cost is being productive in terms of resource allocation. Excelling at these objectives can have internal and external benefits, as seen in the figure above.

### Two common meanings of *Quality*

Quality can be seen as the *specification* of a product or service in e.g. the lower *hurst* farm produces organic meat raised exclusively on its own farm. **OR** Quality can be seen as *conformance* with which the product or service is produced. E.g. Quick service restaurants such as *McDonalds* may buy less expensive meat, but its conformance must be high.

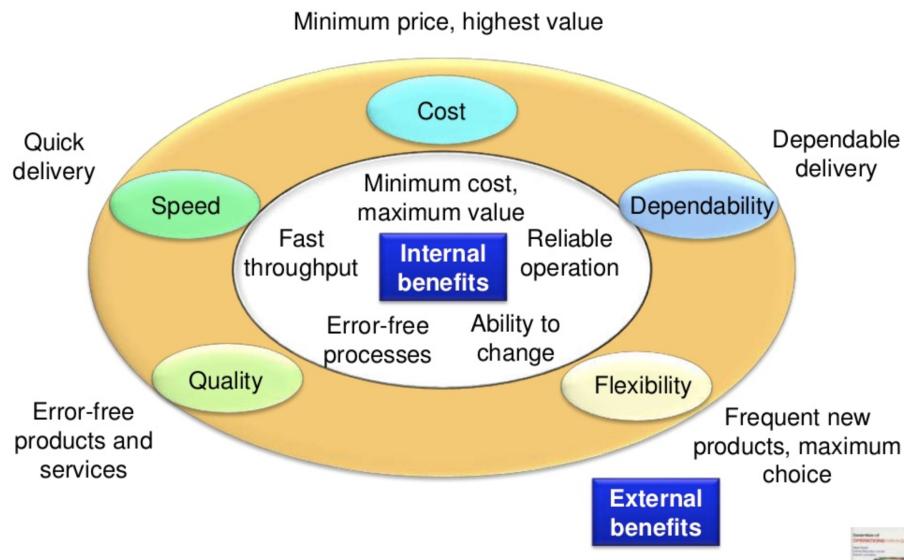


Figure 20: Excelling at the five objectives

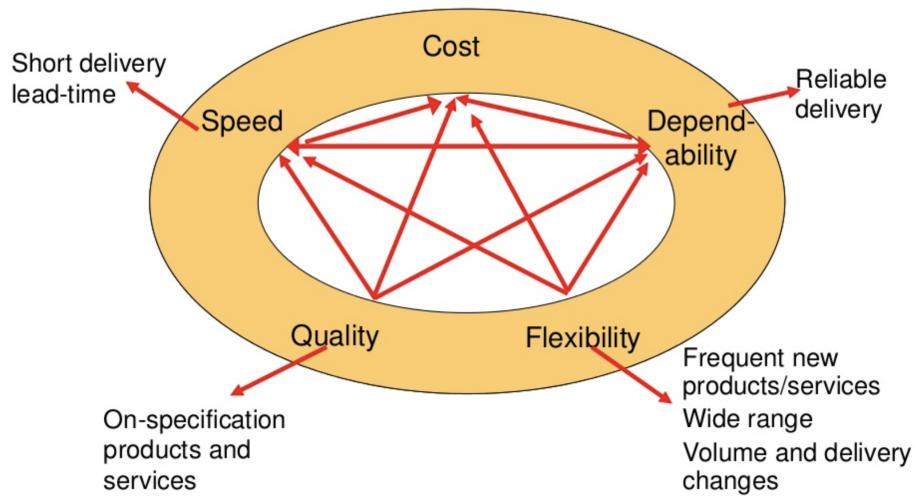


Figure 21: The external and internal benefits

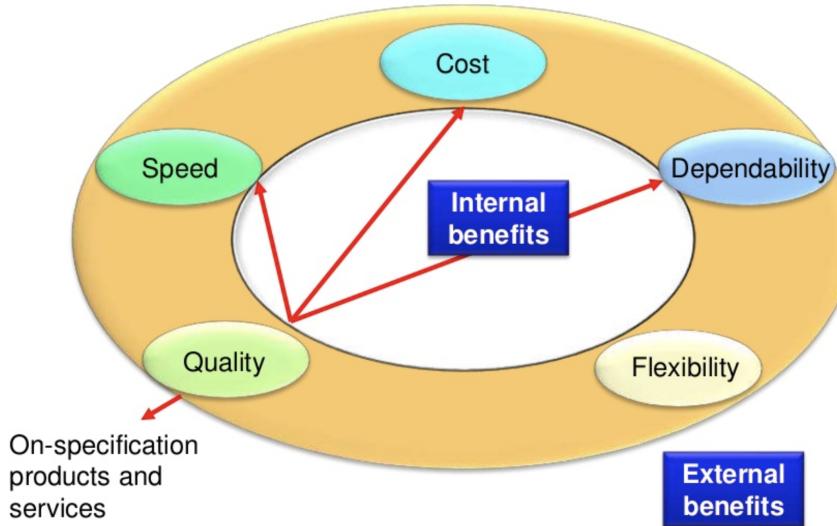


Figure 22: External and internal benefits of conformance quality

#### **External and internal benefits of conformance quality**

Irrespective of a product or service's specification quality, producing it so it conforms to its specification consistently brings benefits to any operation. **Externally** it enhances the product or service in the market, or at least avoids customer complaints. **Internally** it brings other benefits to the operations, such as the prevention of errors slowing down throughput speed, prevention of errors causing internal unreliability and low dependability or the prevention of errors causing wasted time and effort, thus saving cost.

#### **External and internal benefits of speed**

Speed has different interpretations externally and internally. **Externally** it means the elapsed time between a customer asking for a product or service and getting it. (in a satisfactory condition) It often enhances the value of the product/service. **Internally** it helps to overcome internal problems by maintaining dependability and reduces the need to manage transformed resources as they pass through the operation, thus saving cost.

#### **External and internal benefits of Dependability**

**Externally** it enhances the product or service in the market, or at least avoids customer complaints. **Internally** it prevents late delivery slowing down through-

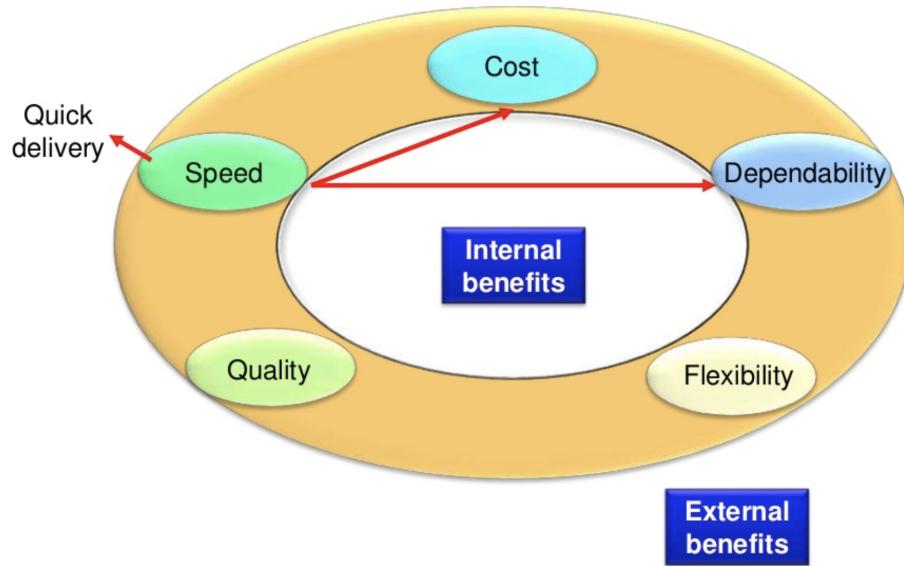


Figure 23: External and internal benefits of speed

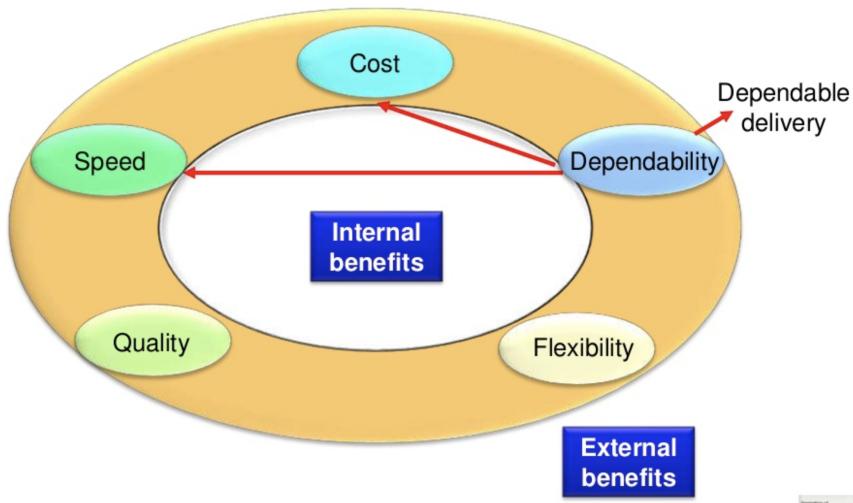


Figure 24: External and internal benefits of Dependability

put speed and prevents lateness causing disruption and wasted time and effort thus saving cost.

### External and internal benefits of Flexibility

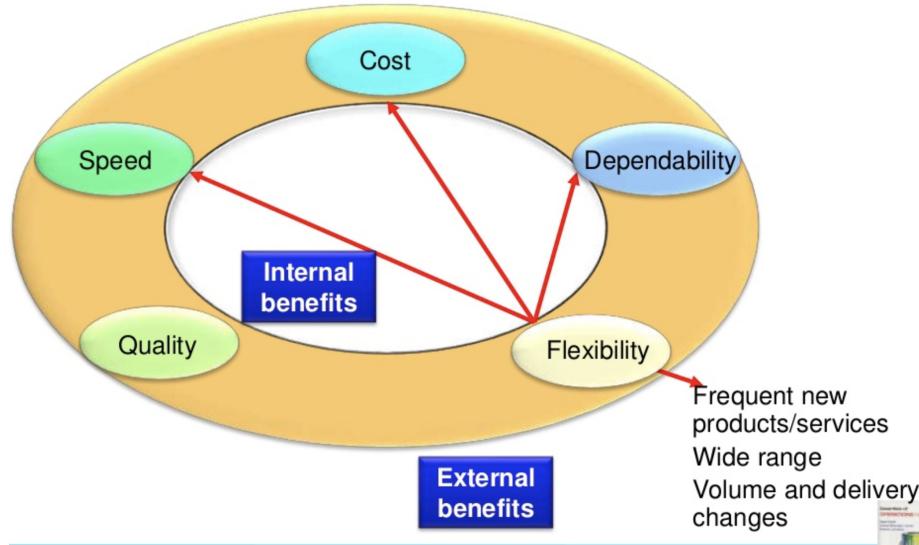


Figure 25: External and internal benefits of Flexibility

Refers to an operation's ability to change.

**Product/service Flexibility** The products/services it brings to the market have to be flexible.

**Mix Flexibility** The mix of product/services at any time.

**Volume Flexibility** The volume of products/services the firm produces.

**Delivery Flexibility** The delivery time of its products/services.

### External and internal benefits of performance objectives

#### Cost

The cost of producing products and services is obviously influenced by factors such as input costs, but two other important sets are: The four V's (volume, variety, variation, visibility) and *the internal performance of the operation* at quality, speed, dependability and flexibility.

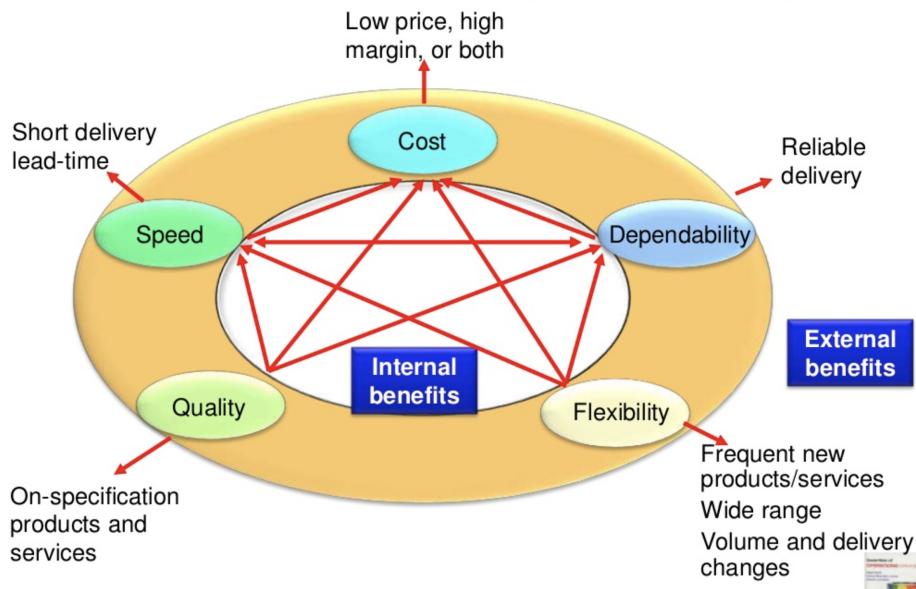


Figure 26: External and internal benefits of performance objectives

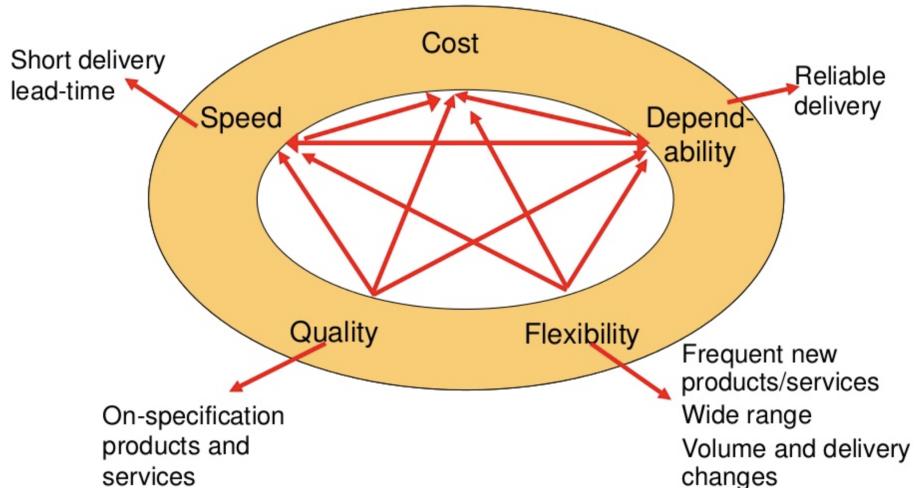


Figure 27: The external and internal benefits

## Polar Diagrams

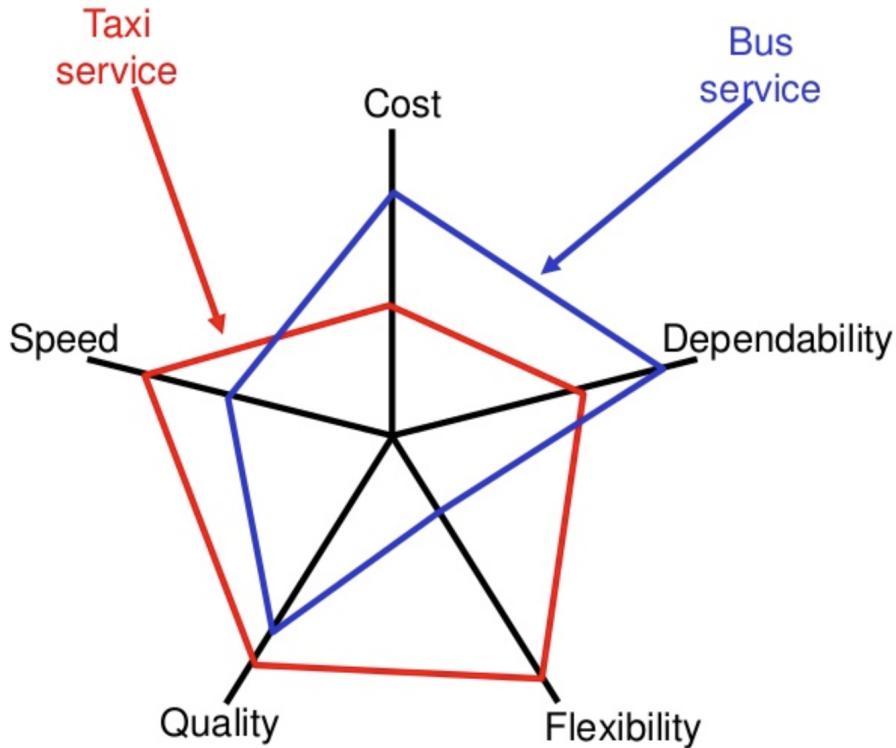


Figure 28: Polar diagrams for a taxi service versus a bus service

Are used to indicate the relative importance of each performance objective to an operation or process. They can be used to indicate the difference between different products and services produced by an operation or process.

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## References

[Slides #1](#) [Slides #2](#)