White paper: make vs buy.

The make vs buy is a strategic decision.

Introduction

Who in your company decides where and who will make the product? Who shapes the business strategy?

Summary

The make vs buy decision is a strategic one. The decision determines the future of the company. The decision is the expression of the business strategy. It is too important to be left to the engineers or to the buyers.

In one day, you can lose your production knowledge. To get this knowledge back, you need at least 5 years.

Who makes the make vs buy decisions within your company?

Problem definition

The choice of a maker, the supplier of the product, is fixed early in the design. The design specification already indirectly determines the frameworks that the manufacturing process must meet. During the design, the team is using the following methodology: choice of the material, choice of the manufacturing process, and choice of surface treatment[1].
These choices are an iterative process. It often happens that the process has to be repeated. several times.

One of the aspects that is often overlooked is that choosing the manufacturer is also a strategic choice. A choice that gives the future of the company. Often in practice, the choice of who makes the product is only based on the commercial aspects.

Who in your company decides where and who will make the product? Who shapes the business strategy?

Business strategy

‘Business strategy is the strategic initiatives a company pursues to create value for the organization and its stakeholders and gain a competitive advantage in the market.’

After hunting, man started to engage in agriculture and cattle breeding. This gave people more time to think. This thinking has resulted in new products such as bread and beer. Thus the crafts came into being. The craftsmen and also craftswomen specialized in making these invented products. The products had to be exchanged for food and other necessities in order to provide for the livelihood of the artisans. The craftsmen also had to eat. Our current prosperity has arisen through the continuous efficiency-improvement mechanism[2], the mechanism that ensures that the preparation of the product and/or service can be produced more and more effectively. With the advent of the industrial revolution with competition on scale, cost, quality and speed[3], it is increasingly important to make a responsible make vs buy decision.

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[1] Methodical design explained. Insights into the methodical design process as it is applied in companies. 2022 ISBN: 9789403679723.

[2] https://en.wikipedia.org/wiki/Experience_curve_effects#References

[3] Quick Response Manufacturing. A Companywide Approach to Reducing Lead Times. Auteur: Rajan Suri. ISBN 9781563272011

What is a make vs buy decision?

Almost every product available on the market has come a long way from raw material to finished product. It may be that oil, pumped up in Venezuela, refined in Pernis, transported by ship to Leverkusen (Germany), there transformed into a plastic granulate, and transported back by truck to a contract painter in Tilburg (The Netherlands), who then turns it into a plastic hair comb. This plastic comb is again transported by truck to a central distribution centre. From there, the comb is taken to a store in your turn. This entire chain is called the 'supply chain'[4]. Translated into good Dutch de 'productieketen'.

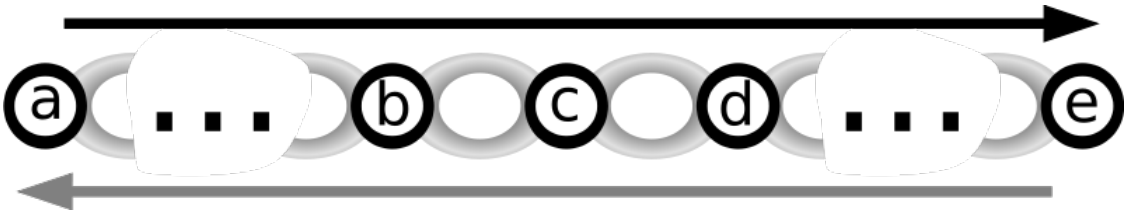

Fig. 1 Supply chain[5]. Money flows from (a) to (e). Products flow from (e) to (a).

If a company wants to bring a new product to the market, the new product has to be made somewhere. It may be that the company that wants to bring a new product to the market decides to make it itself. If the company does not yet have a production process, it will have to set up a new production process. It is also possible that it is decided to purchase the new product. Someone else will then make it. This decision. Making it yourself or buying it is called the make vs buy decision.

Importance make vs buy decision

For a company, a single buy-make decision is not so obvious. However, all make vs buy decisions together largely determine the future of the company. If a company considers it its competence to keep the knowledge and skills in-house, it will make the product or service itself (at all costs). On the other hand, there are multiple producers who can make the product or service. This is clearer in purchasing. If only the costs are taken into account in the consideration, it is possible that the knowledge (intellectual capital) of the company disappears with the purchasing. Reacquiring specific knowledge in the field of, making and assessing design specifications, having design skills and having a well-running production process is very time-consuming and therefore very expensive. Payback periods of 5 to 10 years are not exceptional.

That is why the buy-make decision is an expression of the business strategy.

Decision parameters

Often the make vs buy decision is a result of a thorough or not thorough investigation into the production costs of the product and/or service. Literature[6] on this subject shows that successful companies, when making their purchase decision, do not initially look at the (production) costs at all. Successful companies have developed an expertise to make well-considered make vs buy decisions. This expertise is embedded in the culture of a company. This expertise determines how the organization can effectively and efficiently achieve its long-term goals. It determines the business strategy. It determines the mission, vision and strategy of a company (or organization).

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[4] https://en.wikipedia.org/wiki/Supply_chain#References

[5] Source : http://nl.wikipedia.org/wiki/Supply_chain Author: Maly LOLek

[6] Strategic sourcing: to make or not to make / R. Venkatesan. - In : HBR. - Nov./dec.1992.

Mission

A mission[7] of a company is a briefly described goal of the company. It is, as it were, the dream of the company. It is the company's 'raison d'être'. Roughly speaking, there are three types of reasons for the existence of a company or an organization. These are:

- Maximizing the value of the company to shareholders[8].
- The maximum satisfaction of all interested parties (stakeholders).
- The pursuit of a higher ideal that one can be proud of. An example of such a lofty ideal is the preservation of employment for the region.

Vision

The vision is derived from the mission. A vision is an abstract thought that describes the principle of how to achieve the goal. Starting from the lofty mission of preserving employment for the region, the company's vision could be; maintaining employment for the region by maximizing automation and investing as much as possible in the knowledge and skills of the employees.

Strategy

The strategy is derived from the vision. The strategy is the implementation plan of the vision. Based on the above example, a strategy could be 'the development of an innovative new automated production process in-house by one's own employees'. In this way, maximum investment is made in the knowledge and skills of the employees and there is also maximum automation. In the future, there will probably be 'spin-off' activities that will realize the mission of maintaining employment in the region.

Frameworks make vs buy decision

As expressed in the mission, vision and strategy, the make vs buy decision is therefore of vital importance for the survival of a company. In order to arrive at a responsible make vs buy decision, it is important to first know the frameworks within which a make vs buy decision should be made. Unfortunately, for many employees in a company, it is not always clear what the framework is.

The frameworks in which a buy-make decision should be made are;

- Core competence
- Development infrastructure
- Product modularity
- Production infrastructure
- Supply chain
- Indirect direct costs.

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[7] The concept of "mission" is very culture-dependent. In Dutch culture, the concept is closely intertwined with the spread of the faith. (missionary). In American culture, there is more reference to the long-term goal.

[8] I often have the feeling that only the short-term interests of the shareholders are taken into account in the make vs buy decisions. In my opinion, the interests of the other stakeholders are not or insufficiently taken into account. Investing in knowledge and skills is an asset for the long term. Hence the salutation in the LinkedIn post: '**You can lose your production knowledge in one day. To get this knowledge back, you need at least 5 years.**

Core competence

The core competence is a useful skill that is difficult to imitate. The concept of core competence was first specified in 1990[9]. It must meet the following three aspects. 1 Useful to a customer, 2 difficult to imitate and 3 generally applicable in different markets. Indirectly, the concept has been known for much longer in the form of the saying 'Shoemaker stick to your last'. The concept of core competence is also used to name someone's personal strengths. The concept of core competence is therefore different for every company and for every organization. Examples of a core competence are: Seeing and being able to translate vague customer wishes into concrete products or services. The development and production of .... The bending of complex pipe constructions. Buying and selling fasteners. Providing care. It …

What is the core competence of your company?
Or in other words. What does your company do?

If the answer cannot be given immediately, then the definition of the core competence is either absent or too complex. When making a purchase decision, it is very important to also know the core competence of the supplier. After all, in the supply chain, a supplier is a little further away from the end customer. As a result, the knowledge about the application of the product is less. So not only the supplier's own but also its core competence must be known. This core competence is included in the purchase decision. After all, who doesn't want to do business with 'the authority' in the field in question.

Development infrastructure

In every company or organization, there is a development infrastructure that supports the core competency. Depending on the type of company and the market in which it operates, the development infrastructure can consist of a marketing, development, service and testing department. The characteristic of all these departments is that they are supportive and service-oriented. They support the primary production process. In essence, the development infrastructure is an indirect activity. An activity that does not contribute to the primary production process. Without this activity, it will continue anyway. It's just like a house. If there is no investment in maintenance, the house will fall into disrepair over time. In this contradiction, cost versus future investments, indirect versus direct, also lies the core of the purchase decision.

Why would you invest in an activity that will end in the long term!

Or do we want to maintain an advantage over the competition at all costs!

Product modularity

A module is part of a larger whole. In the case of product modularity, the product is composed of (standardized) modules. These modules, whether standardized or not, can be used multiple times. This makes them more efficient to develop and produce. With a modular product, it is often possible to let the customer assemble the product himself. Del computers, one of the pioneers in this field, has set up its supply chain in such a way that the customer directly controls the entire production process. So Del's core competence is 'having the customer assemble (computer) equipment in a modular way'. Producing a standardized module such as a disk drive is not part of Del's core competence.

When making a purchase decision, it is important to know whether or not it is a standardized module. Few producers will consider making a standardized bolt themselves when making a buying decision.

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[9] Hamel, G. en Prahalad, C. "The Core Competence of the Corporation", Harvard Business Review, vol. 68, nr. 3, mei-juni 1990, pagina 79-93.

Production infrastructure

A production infrastructure is the sum total of facilities that make it possible to produce a product or service. An example of these facilities are the physical factory, the knowledge of the production employees, the energy supply and the waste processing. It is the total that makes the production process possible. If a supplier has a well-functioning existing production infrastructure, then the decision will be made quickly when making a purchase-make decision, provided that the product or service fits into the existing infrastructure. If, on the other hand, there is no production infrastructure in place yet, the company will think twice about investing in a new production infrastructure.

Supply chain

The supply chain or also called the production chain is a network of organizations, people and activities that exchange information (money) and/or products. See Fig. 1. This network is the logistics chain that ensures that the product or service reaches the user. The network transforms raw materials and semi-finished products into finished products.

Every company is part of a 'supply chain'. After all, the 'supply chain' is the result of all the make vs buy decisions made in the past. Having and maintaining a well-functioning supply chain network is a very valuable asset. It has often taken years before the network functions properly. The extent of the consequences is often underestimated if the network has to change. So if the purchase decision can take place within the existing network, the consequences can usually be predicted in advance. If, on the other hand, the choice is made to change the existing 'supply chain' network, the risks and consequences are usually very high.

Indirect and direct costs

For many companies, it is clear what it costs for a product that is purchased. In the supply chain, there is an exchange between money and goods. This is a concrete fact and is therefore clear. Unfortunately, for many companies it is not entirely clear how their own costs are structured. Often, a separate department (accounting) keeps track of the costs in a company. Administrations are often carried out and therefore management is based on income and expenditure. The sales price is then, seen through the eyes of the accountant, the purchase price of the raw materials (material) plus the directly attributable costs (labor) supplemented with the necessary surcharges. These surcharges are, simply put, calculated by summing up all business activities that cost money. All costs that can be directly attributed to the product are deducted from these summed costs. In this way a ratio number is obtained. This ratio is used to determine the selling price of a product or service.

Graphically, the cost structure for a creation product or service looks like this;

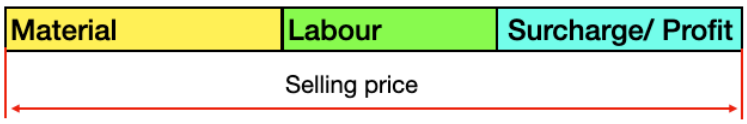

Fig. 2 The selling price structure of a product

If a product or service is purchased, the selling price of the product includes the material price plus a number of surcharges. This is shown in Fig. 3.

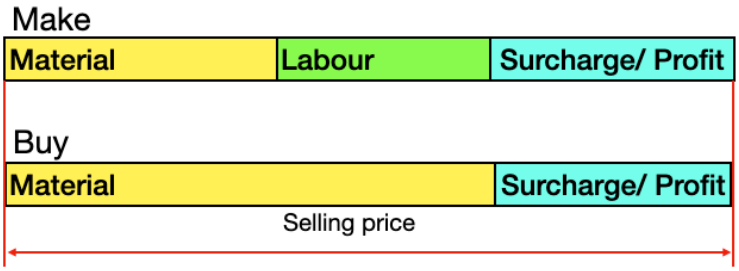

Fig. 3 The selling price structure of a make and buy product

A supplier uses the same method for calculating the sales price for the sales price. As a result, Fig. 2 looks different in reality.

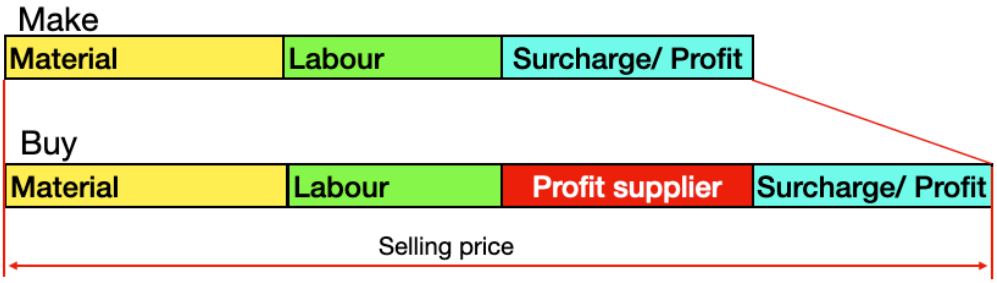

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Fig. 4 The summation of surcharges in the sales price structure.

It turns out (see Fig. 4) that with a purchased product there are two surcharges on the direct costs of the product or service.

Of particular importance in the make vs buy decision are therefore the surcharges. The surcharges include the hidden (indirect) costs. Double surcharges are always processed with a purchased product. These double surcharges will, under equal conditions, always make a purchased product more expensive.

So in principle, the make vs buy decision always turns out in favor of the make decision unless:

- the supplier has a more favorable **economies of scale**, or
- the supplier can produce the product or **service more efficiently** or
- there is **no production infrastructure** (yet) in place or
- The existing **infrastructure** (the indirect costs) will be **adapted.**

Economy of scale

The character of the concept of 'economies of scale' (or returns to scale) is that in a production process of which the number of products increases, the costs per product will decrease. For example, a company that makes 100,000 pieces of a product can do this more efficiently than a company that makes 100 pieces of the same product.

More efficient production

Every production process is essentially a transformation process. This is depicted in the model below.

Each natural or artificial production process can be described as follows: Information (3) in the form of process instructions and/or examples, transform (6) specified (1) raw materials (9) using energy (7) into specified (2) products (10). During the production process, waste (8) is released. External information (5) and (4) and or an interruption of the material flow causes the transformation process (6) to start or stop.

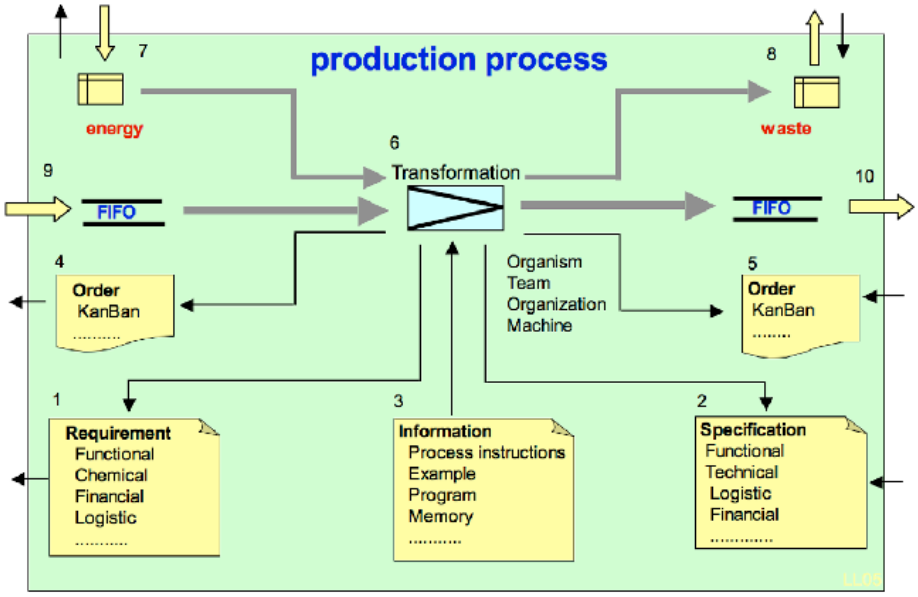

Fig 5[10]. Basic model production process.

This model is also called the basic form of an organization or process.

Designing a completely new production process is very complex and time-consuming. Usually a new product is copy paste of an existing process.

In the process described above, it appears that the production, the transformation of raw material into a (final) product, is not an easy process. It may therefore be that another company can do this much more efficiently.

No production infrastructure

A production infrastructure is the whole that is necessary to ensure that a product can be made. In this context, the whole must be seen very broadly. It concerns the buildings, the manufacturing information, the labor up to and including invoicing. Basically, the product infrastructure is described in Fig. 5 The basic form of the organization.

If the production process described above, for the product or service for which the make vs buy decision has to be made, does not (yet) exist internally while the external infrastructure is already present, then the decision is made in no time.

The make vs buy decision

Now that the frameworks of the buy-make decision are known, making a responsible decision can no longer be so difficult. As mentioned in the introduction, it is the costs that should be looked at last. Making a buy-make decision is just like a negotiation process. First of all, one must agree on the frameworks. Only then can negotiations take place.

Who makes the **make vs buy decisions** within your company?

Justification

This white paper was created to emphasize the importance of knowledge sharing for the manufacturing industry.

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[10] The model of the basic form of a production process is made by seeing a production process as a 'black box'. By describing only the information and matter flows that enter or leave the box, the model was created. In 2005 the model was 'uploaded' to wikipedia.

For more information about the the DfM proces see the book; Design for Manufacturing (DfM) Influence on Quality and Cost. Gate way to manufacturing knowledge. Insight into the production aspect of the design. ISBN 9789403777726

The book is the gateway to knowledge about DfM and DFA. It helps simplify designs and reduce production costs, which usually make up the bulk of a company's investments. The goal of this book is to find the right QLTC balance in a design.

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