



## CASE STUDY VALUE ANALYSIS

In this case study, results obtained from the implementation of the AV methodology in a product of the company Sillas Portillo, located in Sevilla, are shown. This company is dedicated to sell and rent hotel industry material: chairs, tables, cutleries, dinner services, table linens and Sevillian folding chairs.

**VA object:** “*Improving Sevillian folding chair*”.

**Scope:** from the design to the packaging and transport of the product.



*Illustration 1. Sevillian folding chair*

**Objectives:**

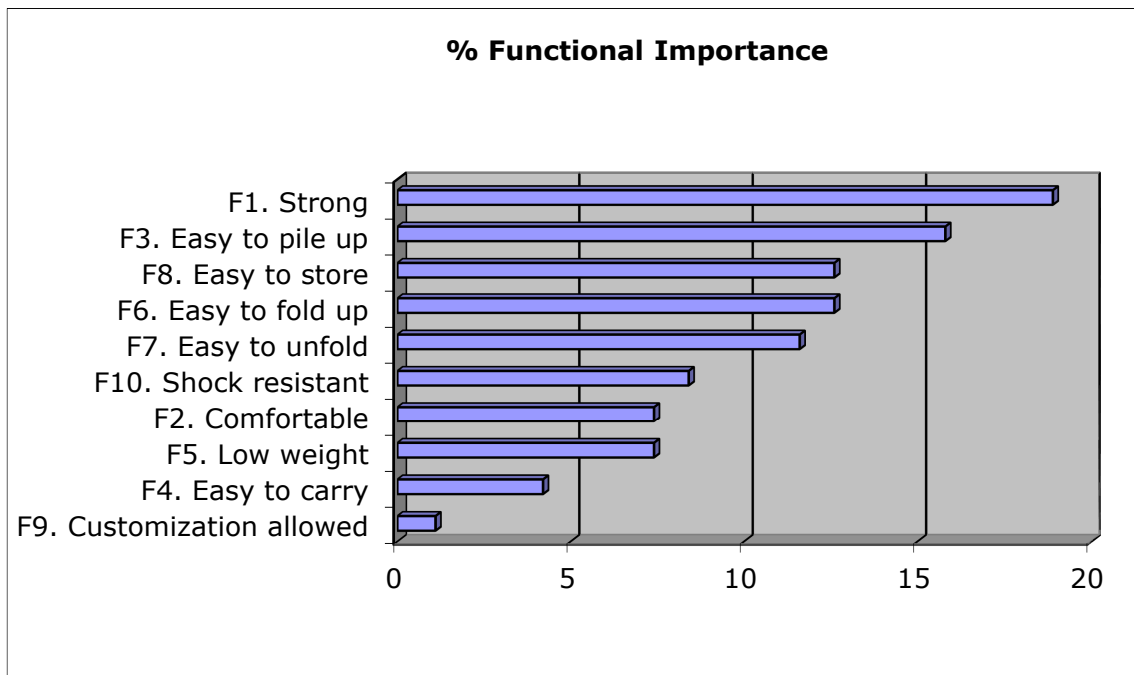
- ✓ Improvement of the chair folding mechanism.
- ✓ Reduction of transport costs.
- ✓ Improvement of customer satisfaction with the product.
- ✓ Increase in the product robustness.

**Restriction:** keeping current suppliers.

**Functional Analysis:** all functions were identified by answering the question “what is it for?”, “what does the *Sevillian folding chair* do to meet the needs of hotel industry customers?”. The working team identified the relative importance of each of the functions to meet customer needs by using prioritization techniques such as the **Alternative Planning Matrix** and the **Paired Comparisons Method**, whose result is shown in the following chart.



**Chart 1.** Relative percentage of importance of each of the functions to meet customer needs (Sillas Portillo case study)



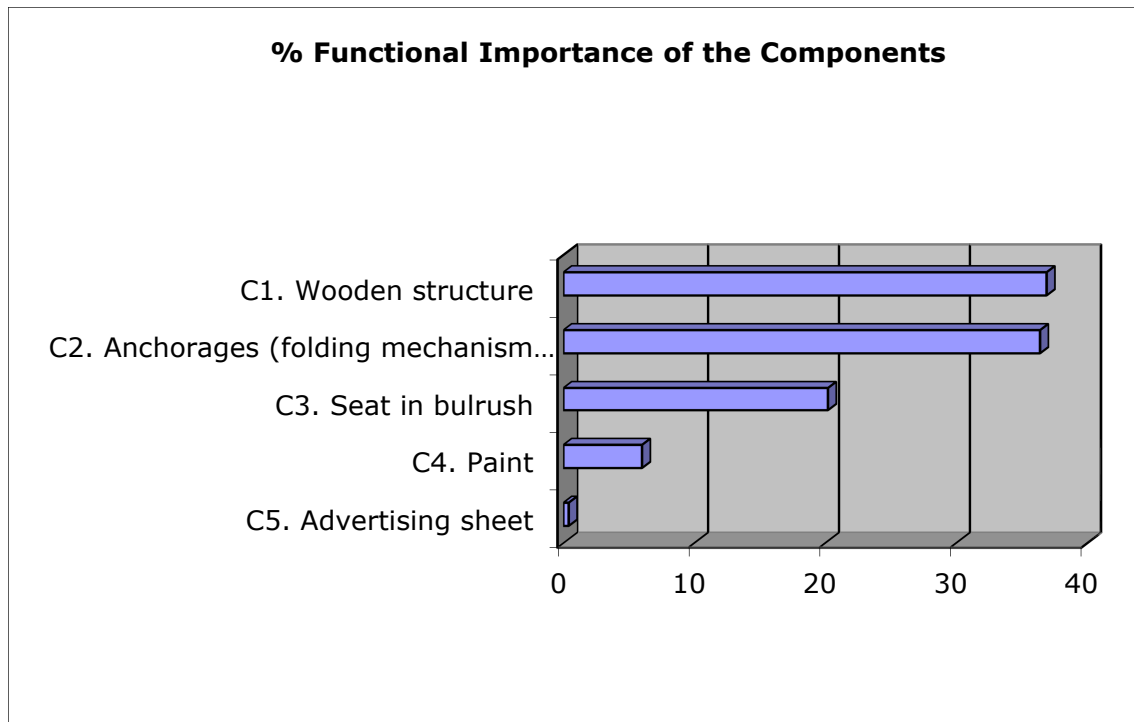
Source: IAT, 2012

Given that the VA Object analyzed is a product, an **analysis of its components** was carried out in order to subsequently calculate the costs and thus determine value indices which will serve as a basis for the innovation and creativity phase.

All components of the *Sevillian folding chair* are shown in the following chart, as well as the functional importance of each of them calculated through the **Functions – Components Matrix**, completed by the working team by answering to the question “how does each component contribute to fulfill each of the functions?”.



Chart 2. Relative percentage of importance of each of the components to fulfill the functions (Sillas Portillo case study).



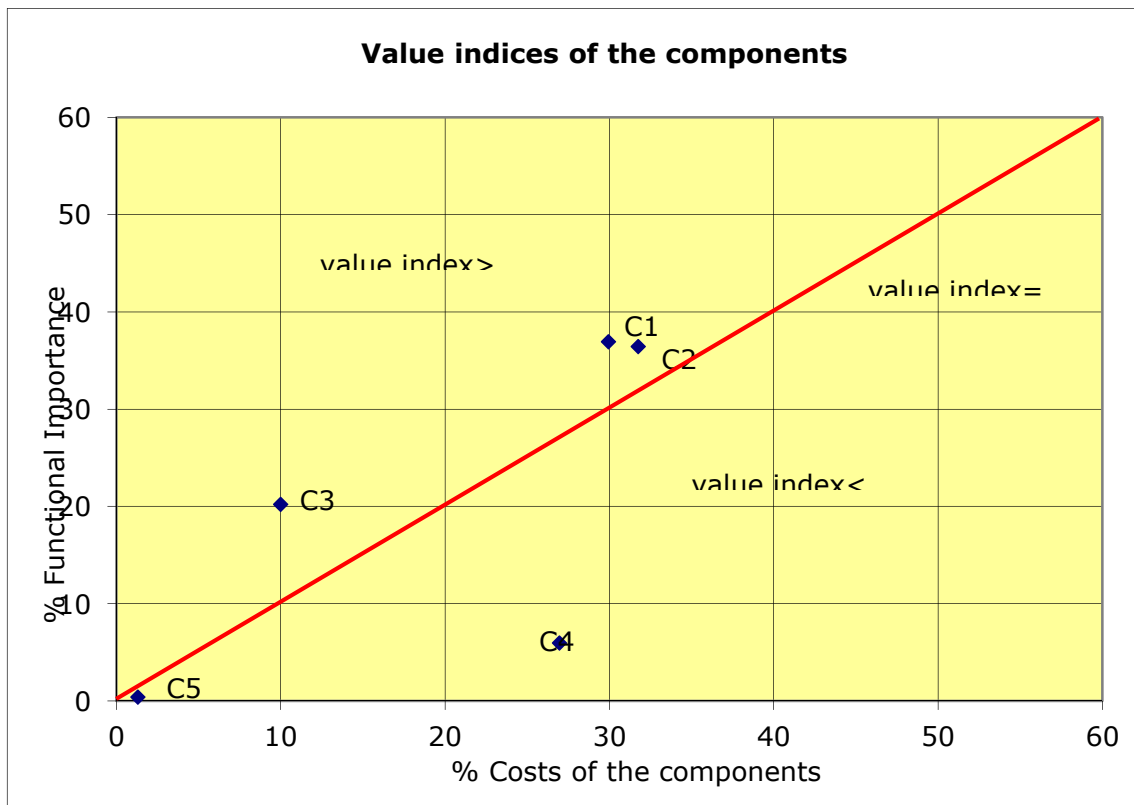
Source: IAT, 2012

**Value indices** of each of them were later determined, taking into account the percentage of cost of each of the components, by applying the following method:

$$\text{Value Index}_{\text{component}} = \frac{\% \text{ Functional Importance of the component}}{\% \text{ Importance in costs}}$$



Chart 3. Value indices of the components (Sillas Portillo case study)



Source: IAT, 2012

Taking into account the initial objectives of the project, **value indices** of the components obtained were **explained**.

In this sense:



- ❖ Components C1 (wooden structure) and C2 (anchorage) have a balanced value index (1,2 and 1,1 respectively) but are subject to analysis for improvement since the robustness of the chair, as well as the folding mechanism, need to be improved.
- ❖ Component C3 (seat in bulrush) has a value index much higher than 1. Even so, since it affects the robustness of the chair, and sometimes it has broken, it is subject to analysis for improvement.
- ❖ Component C4 (paint) has a value index much lower than 1. However, the chair is currently considered to offer a good paint finish that must be preserved, even when the cost is high.





- ❖ Component C5 (advertising sheet) has a value index much lower than 1. However, its cost is already reduced and is considered to offer a good quality and design.

Therefore, the **generation of ideas** aimed at improving components C1 (wooden structure), C2 (anchorages) and C3 (seat in bulrush). Through the **morphological analysis** technique, different possibilities of the components were analyzed and ideas for improving them were raised.

With all this, **two alternative designs** for the improvement of the *Sevillian folding chair* were obtained. Alternative 1 is based on the concept of folding the current chair, keeping the rotation axis, and Alternative 2 is based on the turn within the back of the chair. Improvements provided by both solutions with regard to the current product are described in the following table, classified according to the two alternatives mentioned:

Improvements to be implemented	<b>Alternative 1</b> Current rotation axis 	<b>Alternative 2</b> Turn within the back of the chair 
<b>1.</b> Making back legs and their continuation to the back of the seat of only one piece, fixing the anchorage with a metal clamp and rivets.	Open design clamp, keeping the current rotation axis out of the back of the seat plane.	Open design clamp, to move the rotation axis within the back of the seat in order to obtain a flatter folding.
<b>2.</b> Replacing screws with rivets. This prevents screws from falling, coming loose and also prevents the chair from losing robustness and strength.	Solution for both alternatives.	Solution for both alternatives.
<b>3.</b> Putting washers on the axis so that it does not get stuck. This prevents the lower crosspiece from scraping the housing.	Solution for both alternatives.	Solution for both alternatives.



Improvements to be implemented	<b>Alternative 1</b> Current rotation axis 	<b>Alternative 2</b> Turn within the back of the chair 
4. Strengthening the seat front crosspiece so that it does not break.	Solution for both alternatives.	Solution for both alternatives.
5. Moving the crosspieces of the back of the seat and placing it level with the back legs to leave space to fold the seat up.	----	Solution proposed for alternative 2.
6. In the case where the current folding is maintained, the previous improvement is not possible, so the replacement of the tubes for folded profiles is proposed.	Solution proposed for alternative 1.	----
7. Replacing the set consisting of the wooden side crosspieces and the iron rods that make the turn, for flattened-end metal tubes, fastened to the legs through metal clamps with rivets.	Solution proposed for alternative 1.	----
8. Optimizing the folding mechanism by removing one of the flat bars, leaving it flat and placing an operating button in it. The width of the box where it is located would also be reduced.	Solution for both alternatives.	Solution for both alternatives.
9. New bulrush type for a more resistant seat.	Solution for both alternatives.	Solution for both alternatives.

Because the company needed to adopt a short-term solution which did not involve great changes, and given that alternative 2 required to change or renegotiate with suppliers, the company decided to carry out **alternative 1**.