

Computer integrated manufacturing

[Technology](#), [Computer](#)



The third sequence is presented by letter and identify the production operation type and sequence. To create an Pipit coding system to code a common ball pen, the table 1 was used. According to the data from the table 1, the primary coding to the ball pen illustrated at figure 1 should be 30100. The first number is related with the part class. The analysed pen has 14 centimeter of length and 0.5 centimeter of diameter, resulting in $L/D > 3$. The following number represents external shape and external shape elements.

In the case study, the ball pen does not have shape elements resulting in number 0. The next number is 1, because the ball pen is smooth and one end and does not have shape elements. The ball pen does not have surface machine, so the next number is 0. The last number is related to auxiliary holes and gear teeth, which are things that the ball pen studied does not have, resulting in a number 0. Figure 1: Ball Pen Table 1: Pipit Coding System 1. 2 Working Cell 1. 2. Binary Coded Algorithm A work cell group was formed using Binary Coded Algorithm. Firstly, a table was created relating the products with the required machines. When a machine is required to produce a product, the number 1 was added at the table. If the machine is not required, the number 0 was added. Once the table was completed, the Binary Coded Algorithm was calculated, as can be seen at table 2. Thus, the table was reorganized in a crescent order and grouped in two families. However, there were 7 constraints, as can be seen at table 3.

Table 3: work cell Machine AK AD AC Number 811 569 276 79 52 35 28 26 14 7 3 1. 2. 2 Similarity Coefficient As the Binary coded algorithm does not

consider the production volume, a new work cell was organized using a similarity coefficient. Similarity coefficient is defined according to the figure 2 expression, where X_{ijk} is the operation on part k performed both machines I & J; Y_{ik} the operation on part k performed Just on machine I; Z_{jk} is the operation on part k performed on machine J; and V_k is the production volume of part k.

Figure 2: Similarity Coefficient The similarity coefficient was calculate to every possible par of machines and the results are displayed at table 4. Once the Similarity coefficient was calculated, the machines were groped considering its similarities. For example, the two machines hat have the highest similarity coefficient is A and B and machines B, F and C have the lowest coefficient. Thus, the machines A and B were positioned together. The figure 3 displays the new work cell.

Question 2 a) Make to Stock: This strategy is based on the fact that the customer demand is well known and predictable, which lead the company to work with few production options and to create inventories to respond it, decreasing therefore, the lead time. Assembly to Stock: This strategy is similar to Make to Stock. However, since the company offers a range of different options to its customers, who are not willing to wait when they make an order, sub-assemblies are built and stored in order to educe the lead time, which is higher than the Make to Stock.

Make to Order: At a Make to Order Strategy, products are customized according to customers' requirements. Company offers a wide range of

options, which are only manufactured after receiving a customer' order.

Since the available goods are customized, and this way, the customer is willing to wait, use of big inventories is no longer necessary. Engineering to Order: This strategy offers a high level of customization to its customization, which lead company to work with low inventories and long lead time. B)