

# CHAPTER 5

## RESULTS ANALYSIS



### 5.1 Overview

The concrete indicator is needed to analyze the results how well we can achieve the initial objectives. For this thesis study, the most important indicators we have to take into account after implementing the C&C and design retrieval system are:

- Parts Standardization
- Productivity of tire designer

### 5.2 Results Analysis

#### 5.2.1 Part Standardization

There are 5 indicators for part standardization as following:

- 1) CARCASSE / CAI  
Ratio between Quantity of the 1<sup>st</sup> Assembled and products
- 2) BANDAGE / CAI  
Ratio between Quantity of the 2<sup>nd</sup> Assembled and products
- 3) SF / CAI  
Ratio between quantity of materials and products
- 4) PD / CAI  
Ratio between quantity of component and products
- 5) CX / CXmaxi  
Ratio between quantity of actual and maxi complexing parts

TABLE 5.1 Standardization indicators

	Theo	Nov '03	Dec '03	Jan '04	Feb '04	Mar '04	Apr '04	May '04	Jun '04	Jul '04
CAI		87	87	87	92	92	92			
Qtty of Spec		87	90	84	90	90	90			
CARCASSE		65	70	61	62	62	57			
CARCASSE/CAI	0.8	0.75	0.78	0.73	0.69	0.69	0.63			
BANDAGE		81	83	78	84	84	84			
BANDAGE/CAI	1.0	0.93	0.92	0.93	0.93	0.93	0.93			
SF		54	54	46	47	47	47			
SF/CAI	0.8	0.62	0.60	0.55	0.52	0.52	0.52			
Pieces detachees		347	353	339	386	337	334			
PD/CAI	5.0	3.99	3.92	4.04	4.29	3.74	3.71			
Nb. Complex		363	376	354	399	365	351			
% Mono-NC		57%	57%	55%	52%	52%	52%			
% Bi-NC		43%	43%	45%	48%	48%	48%			
Cx/CxMaxi	0.60	0.49	0.50	0.50	0.52	0.48	0.46			

Since the data base of radial tire components has been exist since Nov '03, all tire designers have been applying the concept of design retrieval by reviewing the existing design manually from the data base to prevent proliferating the new unnecessary components. According to the results, it was obvious that reviewing of existing design during the design process, even just the manual operation, can reduce introduction of unnecessary new component.

Since Mar '04, the application software for C&C and design retrieval has existed either. Therefore, besides preventing proliferation of the new similar components, all the tire designers can also analyze many possibilities to use common part in several areas. For example:

- Suppress GP gauge 0.95mm by 0.90mm
- Suppress RFI gauge 0.50mm by 0.90mm
- Suppress PS material 17000 by 39057
- Suppress NC material CM10321 by CM44100
- Etc

According to the Figure 5.1, apparently, there is an increasing of product from the development process, but not increasing components because the C&C and design retrieval has been in place for the moment. Therefore, the potential to get even better results after implementing the application of classification and coding, and design retrieval is very high.

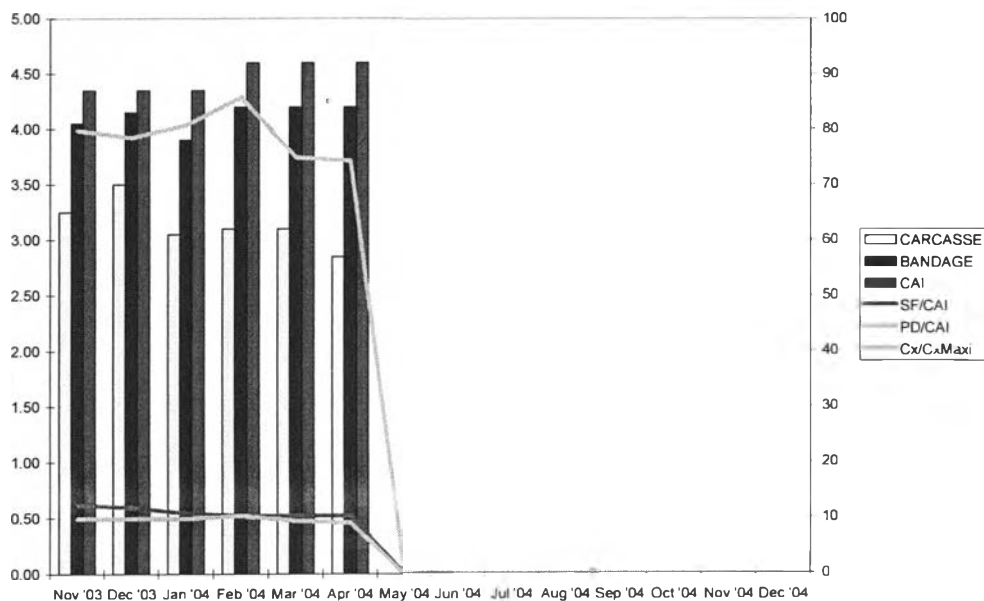


Figure 5.1 Standardization indicators

From Nov '03 to Apr '04, there are

- 3% of CAI increasing
- 12% of CARCASSE decreasing
- 4% of BANDAGE increasing
- 13% of Materials decreasing

- 4% of Components decreasing (PD)
- 3% of Complexing ratio decreasing

### **5.2.2 Productivity of Tire Designer**

Apparently, the application of classification and coding, and design retrieval can increase productivity of tire designer as they do not have to do the complete design process every time. This positive impact could absolutely be improved further if the additional searching tools were added for more flexibility and higher variety in design process.