IV.II.   Assesment vs maturity

Therefore, the results obtained were tabulated using the following format:

Table 25: Assesment maturity results

ASSESSMENT RESULTS				
ASSESSED DIMENSIONS	**S&OP MEMBERS**			
	S&OP LEADER	**DEMAND PLANNER**	**SUPPLY PLANNER**	**SERVICE PLANNER**
Data quality	12	10	12	11
Determination of demand	12	12	11	11
Available resources	12	11	12	11
Data	4	4	4	3
Processes	12	12	12	12
People	12	12	12	12
Organization	12	11	12	9
Score	76	72	75	69
Total score	73			
Interpretation	The ideal level for the company is the optimized one			

As can be seen in the table above, the results obtained show a score of 73. Comparing this result with the maturity level, we found that the ideal level for the company would be the optimized one. Therefore, they should follow the actions recommended by the model to scale from managed to optimized level, as shown in the table below.

Table 26: Recommended actions to scale from one level to another

IMPROVEMENT MEASURES	
INCIPIENT	* Ensure that the information provided is real * Have the necessary data to determine the current situation of the company * Senior management and organization staff commitment * Motivate staff with small incentives.
BASIC	* Creation of templates for collected data standardization * Follow up with areas to determine if organizational objectives have been met * Control group C inventories until reaching the ABC level.
MANAGED	* Receive feedback from all the company's employees * Count on 5% of safety stock * Process mapping * Determine weekly cyclic inventories.
OPTIMIZED	*Continuous improvement to ensure effective compliance with S&OP process.

Table 27: Actual vs. Model

INDICATOR	BEFORE	AFTER	PERCENTAGE DIFFERENCE
Inventory turnover	50%	25%	−25%
Demand forecasting errors	84%	10%	−74%
Percentage cost of spare parts on total rentals	S/. 13,462.25	S/. 6,410.60	−52%
Overstock	56.41%	8.74%	−47.67%

IV.III. Actual vs model

To determine the improvement of inventory management in the case study, we took into account the following indicators, which were measured before and after the implementation of the proposed model. We have selected these indicators because the criteria they consider are found in the S&OP process.

$$Inventory\ turnover\ = \frac{annual\ outputs}{Maximum\ monthly\ probability}$$

$$Demand\ forecasting\ errors = \frac{Demand\ forecast - Actual\ Demand}{Actual\ Demand}$$

$$Percentage\ cost\ of\ spare\ parts\ on\ total\ rentals = \frac{Spare\ parts\ expenses}{Rentals}\ x\ 100$$

$$Overstock\ percentage\ = \frac{Overstock * 100}{Total\ inventories}$$

The results of this comparison are shown in the above table (table 27).

As can be seen, the improvements achieved were very significant for the company. Among them, demand forecasting errors and overstock were two indicators that were significantly reduced, since they are related to each other and the model focused directly on them.

On the other hand, the model also generated other positive impacts on the organizational environment. First, by implementing and validating the proposed model, the environmental impact was reduced, since only the spare parts necessary for business operation will be requested and thus, suppliers will reduce the pollution level upon manufacturing. Secondly, there is the social impact. This is generated by the great impact on the organization employees' quality of life, since it reduced tensions and achieved efficiency by allocating the necessary resources and approving modifications in capabilities. Moreover, S&OP allowed for improved resource distribution and thus greater profitability for the company. Finally, the company may propose security policies through the improvement actions identified during the process.

V. CONCLUSION

S&OP model was easily accessible for SMEs in the industrial machinery rental sector, as it helped to optimize inventory management. As shown by the results, the main problem, namely the Overstock was reduced by 47.67%, which proves that the proposed model is effective and efficient. In the same manner, demand forecasting errors were reduced by 74%, as they were related to the main problem and the process was significantly improved as shown in the result.

Furthermore, the S&OP model implementation allowed the company to improve the work climate and the integration between areas, since the tools proposed by the model can improve those aspects that are not understood and generate organizational chaos.

On the other hand, the maturity model allows the organization to know its level and what actions needs to be taken to scale to another level in order to improve the inventory management process in the organization. Finally, the result of the assessment allows for generation of the improvement plan through the proposed actions in order to bring the company up to the desired level of the maturity model.

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