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Comperasion Analysis Of Piano Chairs Secondary Packaging At Pt. Chitose International Tbk

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ABSTRACT

PT. Chitose International is an industrial company operating in the furniture sector which is one of the manufacturers of piano chairs. In the distribution of these products to Japan, there were 5% defects in the packaging within a year. However, the company has a defect tolerance standard of only around 4%, this causes the author to want to make suggestions regarding the addition of plastic wrapping packaging to reduce packaging defects. This research uses the Monte Carlo simulation method with the simulation assumption of a reduction in defects of 2%, 5% and 8%. After carrying out a simulation of reducing defects by 2% in 1 year, cardboard damage can be reduced from 1,248 to 1,229 cardboard boxes, thereby saving Rp. 15,797,593. A simulation of reducing defects by 5% in 1 year can reduce cardboard damage from 1,230 to 1,169, thereby saving Rp. 38,758,762. A simulation of reducing defects by 8% in 1 year can reduce cardboard damage from 1,258 to 1,158, thereby saving Rp. 63,419,700.

INTRODUCTION

The furniture industry is one of the industrial sectors that is growing rapidly in Indonesia. The need for products from the furniture industry continues to increase because this industrial sector provides interior design and artistic value that can provide comfort so that it can support various activities. The furniture industry in Indonesia also now plays an important role as a source of foreign exchange for the country because product enthusiasts are not only domestic but also abroad. This situation makes furniture manufacturers compete to produce high quality products. One way to maintain the quality of a product is with appropriate and safe packaging during delivery. Delivery is an important part of a supply chain which functions to prepare and send goods to consumers (Yunarto, 2006) (Bowersox, 2002). Before the product is sent, it must be accompanied by packaging activities for the product so that it reaches the consumer's hands correctly and safely. Packaging is an activity that includes various components consisting of preparing the product to preparing a container or wrapper to protect or prevent damage to the product being sold and can even be a means of information and marketing, thereby attracting interested buyers (Deschasaux-Tanguy et al., 2021).

Packaging is a coordinated system for preparing goods so they are ready to be transported, distributed, stored, sold and used. Containers or wrapping are packaging methods that can help prevent or reduce damage, protect the product inside, protect it from the dangers of pollution and physical disturbances (friction, impact, vibration). Apart from that, packaging functions to place processing results or industrial products in forms that make it easier to store, transport and distribute. Promotion of containers or wrappers can help increase buyer attraction. Therefore, the shape, color and decoration of a product's packaging need to be considered in planning. Packaging,

PT. Chitose Internasional TBK is a company operating in the fields of industry, trade and furniture services. Currently the company produces and sells various kinds of furniture products, such as folding-chair, folding-

chair+ memo, hotel banquet & restaurant chair and table, working & meeting space. school education. and hospital items.

Chitose has distributed its products in various regions in Indonesia, including Java, Bali, Sumatra, Kalimantan, Sulawesi and Papua. Domestic product marketing is strengthened by a network of distributors and agents which currently reaches 22 distributors and 850 agents. Apart from domestic trade distribution, Chitose has also exported to several countries on various continents: Among them are several countries, namely Saudi Arabia, United Arab Emirates, Thailand, South Africa, Sri Lanka, Brunei, Hong Kong, Taiwan, Malaysia, Singapore, Japan, Germany , United Kingdom, Egypt, United States, South Korea, Australia and New Zealand.

In the last 3 years PT. Chitose has collaborated with PT. Kawai Indonesia produces kawai chairs (piano chairs) which will be sent to Japan. Within a month PT. Chitose can send ±900-3,000 pcs of Kawai chairs to Japan. Where the kawai chair will be put into packaging following the existing SOP with the outer packaging being cardboard. Before the kawai chair is put into the cardboard box, it has been covered with several more cardboard boxes to keep the kawai chair from being easily damaged during travel. The type of packaging used by Chitose for packaging this Kawai chair is overlapping cardboard packaging with a single wall word corrugated board type.

Image of Kawai Chair Packaging Cardboard Types

Picture of Kawai Chair Legs and Components

Kawai Chair Upholstery Images

Image of Kawai chair in Packaging

After the goods are packaged, the next step is that the goods are stored on pallets and stacked in up to 56 boxes.

Image of 56 boxes stacked in boxes

After the goods are stored on the pallet, we double-check whether the number and type of kawai chairs to be sent are suitable or not, and if they are suitable, the pallet will be carried using a hand pallet into a container, this container can accommodate approximately 36 pallets. The goods that are already in the container will then be sent to PT. Kawai in Japan uses containers by sea. There were problems with delivery, namely that some Kawai chair packaging boxes were sometimes damaged after arriving in Japan.

Image of Defective Packaging

The images above are several examples of damaged Kawai chair packaging boxes, with this situation causing losses to both parties, both the Indonesian producer as the party sending the product and the Japanese company as the party marketing the product. Losses on both parties are caused by consumers who are dissatisfied with the quality of the product they receive due to reduced aesthetic value due to damaged packaging. As a result of the losses experienced by both parties, reverse logistics activities between Japan and Indonesia did not occur because it would incur very large costs. In general, the cause of damage to a product is poor packaging (Dwiantara & Sumarto, 2004).

Based on the statement above, packaging damage during delivery is very high because it exceeds the company's defect tolerance limit. Based on information from Mr. Dadan as production manager at Chitose from Figure 1.6, it shows that the packaging experienced damage during the journey to Japan which was caused by shocks, causing the packaging to tear. and suffered scratches on the side of the box caused by the rope used to tie the box. This fact gives the impression that the packaging used is not safe for shipping abroad, so efforts need to be made to develop and innovate the packaging for this kawai chair.

Because the packaging currently used is not safe and causes some packaging to tear, it is necessary to add packaging using plastic wrapping, this plastic wrapping will make the product safe when traveling, this type of packaging is able to protect items from scratches or water, almost all items use Plastic packing as extra protection, this plastic warp is transparent, not easily torn, flexible, easy to stick and waterproof. Based on the journal "analysis of the packaging and stuffing process of local furniture companies in maintaining the existence of global competition" the solution is given that good packaging for furniture sent abroad is better to use plastic wrap to minimize damage to the furniture packaging, Because every item can be damaged if it is shaken during the

shipping journey, one of which is international shipping via sea. If at any time an unexpected event occurs and causes the package to get wet with water, plastic packaging will protect it well (Dahono, 2021).

Additional Image of Packaging Using Plastic Wrapping

By adding packaging, we can find out whether it can reduce packaging damage or not. Based on the journal "MONTE CARLO SIMULATION IN PREDICTING NUMBER OF DELIVERIES AND TOTAL REVENUE", the author uses simulation to predict the number of shipments and total income using monte carlo, because by using monte carlo simulation this can be used as a prediction method, several parameters also influence the accuracy of the results of the simulation monte carlo (Hasugian et al., 2022). So it is necessary to carry out a simulation, one of the simulations that can be carried out is a Monte Carlo simulation, a quantitative simulation that is used to assess risk by calculating the probability of the final result due to uncertainty involving random variables based on the distribution characteristics of the input/data being analyzed (Marpaung & Sitompul, 2022). By simulating the addition of packaging using plastic wrapping, we will find out whether the addition of this packaging can reduce packaging defects or not, and it is hoped that this research can minimize packaging damage that occurs when shipping to Japan and become the basis for further research on secondary packaging. .

METHOD

The methodology used in this study is to use a qualitative and quantitative approach. The data were obtained by conducting field observations and interviews at PT. Chitose Internasional, the results were obtained after conducting field observations, namely the conditions in the warehouse with the process of making piano chair components, the process of packing piano chairs using cardboard until shipping, while the data obtained through interviews, namely regarding what type of piano was sent, the packaging used was like what, the order flow to delivery, how many boxes per pallet, how many requests a month, packaging defects for a year with the aim of analyzing the problems that occur. The results of the data collected will be analyzed, to analyze the reduction in the number of defective packages after shipping wrapping, used simulationMonte Carlo, which is an easy-to-use method for arriving at possible outcomes for uncertain events and their associated confidence limits. The probability of the number of defective packages is determined between 2%, 5% and 8%. Furthermore, the average number of damage per month is simulated by the methodMonte Carlorepeated up to 1000 times to get close to the estimated value. After simulating a series of experiments by selecting a random number and entering a probability value to find the total number of defective packages after usewrapping, then calculate the costwrappingfor the amount of shipping, calculate the cost of compensation without packaging wrappingand compensation costs after using the packagingwrapping. Calculating cost savings replace loss, calculate the cost of savings by usingwrappingand Continuing the simulation for all probability values of the percentage reduction in disability.

RESULTS AND DISCUSSION

The table below is the final result of the simulationMonte Carlo, with a predetermined probability of decreasing defects for one month per one delivery. For the probability of reducing packaging defects by 2%, the average reduction in packaging defects from 104 boxes becomes 102 boxes usingwrappingwith average costwrapping Rp. 1,214,219 and an average packaging compensation fee withwrapping Rp.64,506,837 and withoutwrapping Rp.65,823,303, then the average compensation savings is Rp. 1,316,466, so the total average savings for a 2% reduction in disability is Rp.102,247.

If the probability of reducing packaging defects is 5%, the average reduction in packaging defects from 103 boxes becomes 97 boxes usingwrappingwith average costwrappingRp. 1,214,219 and the average cost of compensation for packaging withwrappingRp. 61,368,040 and withoutwrapping Rp.64,597,937, then the average

compensation savings is Rp. 3,229,897, so the total average savings for a 5% reduction in disability is Rp. 2,015,677.

If the probability of reducing packaging defects is 8%, the average reduction in packaging defects from 105 boxes becomes 96 boxes usingwrappingwith average costwrappingRp. 1,214,219 and the average cost of compensation for packaging withwrappingRp. 60,777,212 and withoutwrapping Rp.66,062,187, then the average compensation savings is Rp. 5,284,975, so the total average savings for an 8% reduction in disability is Rp. 4,070,756.

Table 1**.** The Average Savings Results for PT. Chitose International TBK Per Month According to Monte Carlo

Probabilitas	**Average Disability Packaging**		**Average Cost *Wraping***	**Average Compensation Cost**		**Average *Saving* Cost Compensation**	**Average Total *Saving***
	Without *Wraping*	**With *Wraping***		**Without *Wraping***	**With *Wraping***		
2%	104	102	Rp1.214.219	Rp65.823.303	Rp64.506.837	Rp1.316.466	Rp102.247
5%	103	97	Rp1.214.219	Rp64.597.937	Rp61.368.040	Rp3.229.897	Rp2.015.677
8%	105	96	Rp1.214.219	Rp66.062.187	Rp60.777.212	Rp5.284.975	Rp4.070.756

The table below describes the simulation results of savings in one year and is assumed to be multiplied by 12. For a 2% probability reduction in packaging defects, the average reduction in packaging defects from 1248 boxes to 1229 boxes using wrapping with an average cost wrapping Rp.14,570,632 and the average compensation cost for packaging with wrapping is IDR 774,082,043 and without twrapping Rp.789,879,635, then the average compensation savings is Rp. 15,797,593, so the total average savings for a 2% reduction in disability is Rp.1,226,960.37.

If the probability of reducing packaging defects is 5%, the average reduction in packaging defects from 1230 boxes becomes 1169 boxes usingwrappingwith average costwrappingRp. 14,570,632 and an average packaging compensation fee of Rpwrappingin the amount of IDR 736,416,482 and withoutwrappingRp. 775,175,244, then the average compensation savings is Rp. 38,758,762, so the total average savings for a 5% reduction in disability is Rp.24,188,129.89.

If the probability of reducing packaging defects is 8%, the average reduction in packaging defects from 1258 boxes becomes 1158 boxes using wrappingwith average cost wrapping Rp.14,570,632 and an average packaging compensation fee with wrapping Rp.729,326,548 and without wrappingof Rp.792,746,248, then the average compensation savings of Rp.63,419,700, so the total average savings for an 8% reduction in disability is Rp.48,849,067.48.

Table 2**.** Average Results for PT. Chitose International TBK Annually Monte Carlo Compliant

Probabilitas	**Average Disability Packaging**		**Average Cost *Wraping***	**Average Compensation Cost**		**Average *Saving* Cost Compensation**	**Average Total *Saving***
	Without *Wraping*	**With *Wraping***		**Without *Wraping***	**With *Wraping***		
2%	1248	1229	Rp14.570.632	Rp789.879.635	Rp774.082.043	Rp15.797.593	Rp1.226.960,37
5%	1230	1169	Rp14.570.632	Rp775.175.244	Rp736.416.482	Rp38.758.762	Rp24.188.129,89
8%	1258	1158	Rp14.570.632	Rp792.746.248	Rp729.326.548	Rp63.419.700	Rp48.849.067,48

By using a Monte Carlo simulation, it can be seen that with the proposed addition of plastic wrap packaging on a pallet containing cardboard Kawai piano chairs, it can reduce packaging damage, from what was originally damaged in the box, causing both companies to suffer losses, both the Indonesian producer as the party sending the product, as well as Japanese companies as parties who market these products because the Japanese cannot market these chairs due to reduced aesthetic value due to damaged packaging that occurs on the road. As a result of this loss causes no activity reverse logistics between Japan and Indonesia because it will incur enormous costs. So given the proposal in order to reduce the company's losses.

From the simulation above it can be seen that by using wrapping plastic can reduce packaging defects, as for the comparison between using additional packagingwrappingand do not use additional packaging wrapping:

Table 3**.** Perband Comparison of Using Additional Wrapping and Not Using Wrapping

Without *Wraping*	With *Wraping*
Packaging is easy to tear	Can protect packaging from damage or tear
Dusty/dirty packaging	Packaging will not be dusty/dirty
cardboard can move	Cardboard will not move

CONCLUSION

From the results of research that has been done at PT. Chitose International Tbk (CINT) regarding a method that can reduce CINT losses due to damage to the Kawai piano chair packaging that is exported to Japan, based on the monte carlo simulation method of coating pallets containing 56 boxes of Kawai piano chairs with plastic wrapping can reduce cardboard damage and further reduce company losses , as follows The probability of a 2% reduction in records in 1 year can reduce cardboard damage from 1,248 to 1,229 boxes, so the company can save Rp. 15,797,593. The probability of a 5% reduction in records in 1 year can reduce cardboard damage from 1,230 to 1,169, so the company can save Rp. 38,758,762. The probability of a decrease in records of 8% in 1 year can reduce cardboard damage from 1.258 to 1.158, so the company can save Rp. Rp. 63,419,700. This shows that the use of additional plastic wrapping packaging is effective in reducing damage to the piano chair cardboard packaging.

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