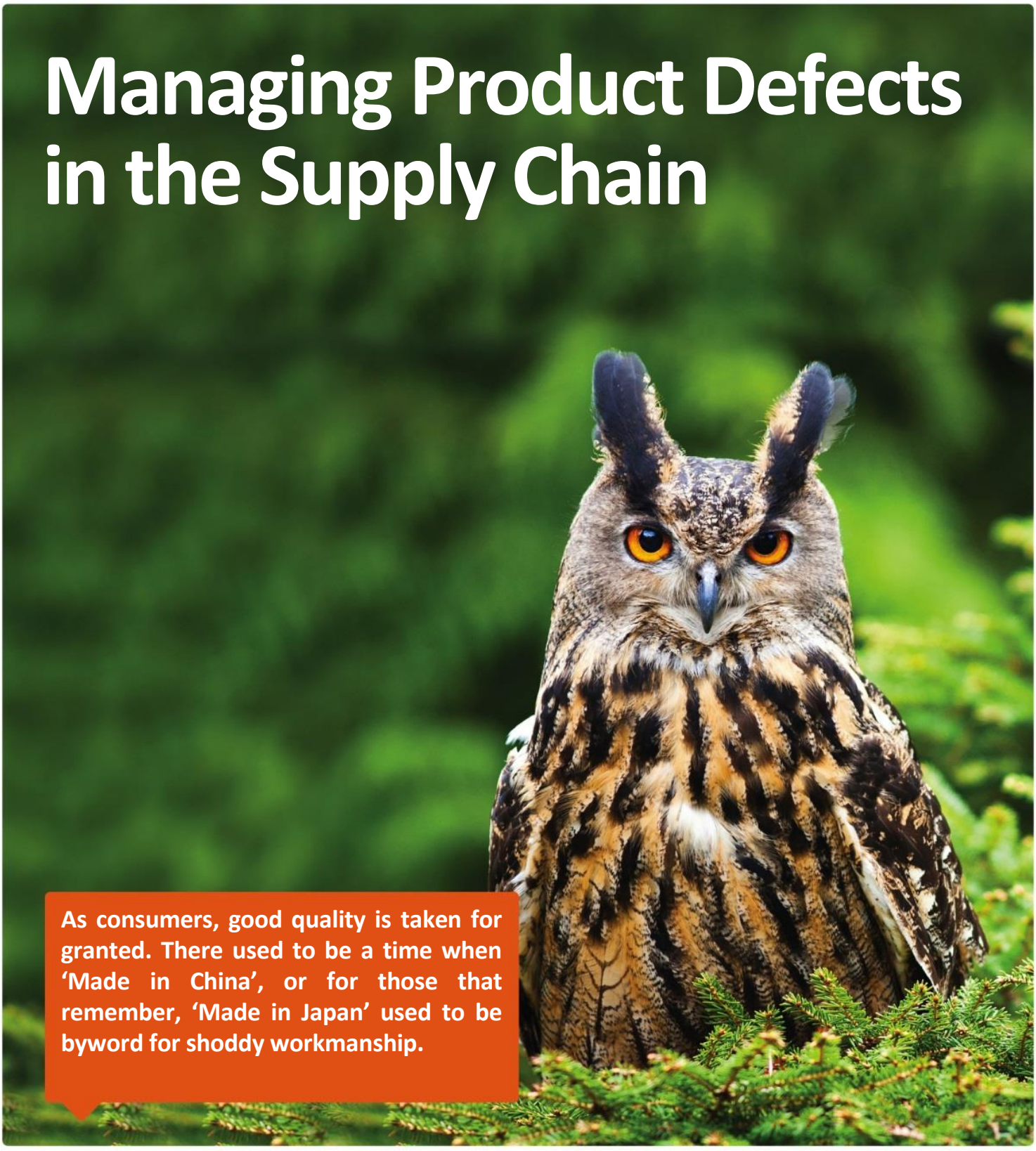
Managing Product Defects in the Supply Chain



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Introduction

As consumers, good quality is taken for granted. There used to be a time when 'Made in China', or for those that remember, 'Made in Japan' used to be byword for shoddy workmanship. Partly through the globalisation of manufacturing, countries like China and Japan are able to produce high quality consumer goods for the Australian market. It is estimated that in 2008 the value of imports into Australia was 187.2 billion Australian dollars. China was the top import partner in 2007 (15.5% of the total value of imports[1]); Japan the third largest at 9.6%). In the global marketplace there will be Australian manufacturing companies in competition with Far Eastern manufacturers. It is therefore all the more important, for Australian manufacturers to manage defects in their supply chain.

Managing the delivery of a defective part

The following could be a typical scenario in a manufacturing company. In simple terms, following procurement sourcing procedure the supplier would have delivered the part (or batch of parts) to goods inward on the customer premises. The part is found to be non-conforming[2]. What are the options available to the procurement manager? The top priority for procurement is to ensure continuity of supply to enable the factory to continue operating. The starting point is to ascertain in what way the part is non-conforming. There have been instances where it was not the individual part that was non-conforming, but the packaging was not according to specification. If the part itself is non-critical then the quality department might agree to allow it to come in under a concession note.

Critical parts will need to be managed in a different manner. The use of safety stock will meet immediate needs. There are a number of options available for dealing with the defective part. They include the following:

- The part is rejected and returned to the supplier for them to rework/replace.
- The cost of rework by the customer is charged to the supplier.
- The part is scrapped (and returned to the supplier). They send in a new part.

Identifying the cost of quality

Addressing quality defects is a non-value adding activity. In the words of the quality guru Crosby (1984), "There is the erroneous assumption that quality is intangible and therefore cannot be measured. In fact quality is precisely measurable by the oldest and most respected measurement – cold hard cash". Crosby 1979.

What should be the policy regarding quality defects? Charging a supplier for the cost of rework is relatively easy as the cost of reworking the part is quantifiable. What is more difficult is to quantify the expenditure in resources used to manage the part through the supply chain. For example, receiving and booking in the individual part would take up time, as would the management of any resultant defective part through the supply chain.

[1] https://www.cia.gov/library/publications/the-world-factbook/geos/as.html

[2] The cost of non conformance can be defined according to BS6143, Part 1 1993, as 'the cost of inefficiency within the specified process that is the non-essential process costs'. This may not involve the production of a defective product, but is the cost of doing non specified operations.

What is important is to do a root cause analysis on why these non-conforming parts are entering the supply chain. Do procurement procedures and processes need to be improved? Has there been a change in the manufacturing processes employed by the supplier? Keeping a log of the occurrences will be a powerful negotiating tool should suppliers ask for a price increase.

A prudent company makes certain its products and services are delivered to the customer by a management system that does not condone:

- Rework
- Repair
- Waste
- Non-conformance of any sort

The costs of quality can become a considerable percentage of the overall operating costs of the organisation. It is estimated that the cost of quality absorbs between 15 to 40% of revenue[3].

In order to be able to monitor quality more closely, some breakdown of costs need to be made. A suitable checklist, divided into three distinct categories has been produced by the American Society for Quality Control.

1. Prevention Costs

The costs of all activities specifically designed to prevent defects in deliverable products. These include activities prior to and during product development, purchasing, operations planning and execution, operations support and after sales service.

2. Marketing/customer/user

Costs incurred in the accumulation and continued evaluation of customer and user needs and perceptions.

3. Product design development

Costs incurred to translate customer and user needs into reliable quality standards and requirements and manage the quality of new product developments prior to the release of authorised documentation for trial production.

4. Purchasing

Cost incurred to assure conformance to requirements of supplier parts, materials or processes and to minimise the impact of supplier non-conformances on the quality of delivered products or services. It obviously involves activities pre and post contract.

5. Operations (manufacturing or service)

Costs incurred in ensuring the capability and readiness of operations to meet quality standards and requirements, quality control planning for all production activities and the quality education of operating personnel.

[3] MSc/MBA study by K Scanlan, K Drakeley, R de Sousa and P Morriss, The Cost of Quality, The University of Derby, Derby Business School, April 1994.

6. Quality administration

Costs incurred in the overall administration of the quality management function.

7. Appraisal costs

The costs associated with measuring, evaluating or auditing products or services to assure conformance with quality standards and performance requirements. These include the inspection, test or audit or purchased materials, manufacturing or process operations, operations support documentation and materials, and installation costs, as well as expenses and depreciation.

8. External appraisal costs

External appraisal costs will be incurred any time there is a need for field set up or installation and check out prior to official acceptance by the customer. It would also be applicable when there is a need for field trials or new products or services.

9. Review of test and inspection data

Costs incurred for regularly reviewing inspection and test data to release of the product for shipment, such as to determine whether product requirements have been met.

10. Miscellaneous quality evaluations

The cost of all support area quality evaluations, (audits), to assure continued ability to supply acceptable support to the production process. Examples of areas included are mailrooms, stores, packaging and shipping.

11. Failure costs

Internal and external failure costs required to evaluate and either correct or replace products or services not conforming to requirements or customer/user needs. This includes purchased materials, and associated product or service design and support materials because they failed to meet requirements or customer/user needs. This includes both material and labour costs with fringe benefits.

Conclusion

In order to improve quality it is no longer enough to simply employ more inspectors. It is vital for all companies to find ways of working which improve quality without increasing cost. In order to improve quality one has to measure it and compare it to its previous cost. For this reason, quality costing is becoming more and more important.

Using conformance/non-conformance would seem to be a good starting point for controlling all of the organisations quality costs; but it does require a definition of what conformance means in all areas where it is to be applied. One of the most important uses of quality costing is in the support and promotion of Total Quality Management (TQM) which advocates a process of continuous improvement. To this end, everybody in the organisation must be customer focused, responsible for quality, and committed to delivering continuous improvement within their organisation. These measures would go some way to reducing the receipt of non-conforming parts from suppliers.

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