Management Case Study Examination

May – August 2026

Pre-seen material

Context Statement

We are aware that there has been, and remains, a significant amount of change globally. To assist with clarity and fairness, we do not expect students to factor these changes in when responding to, or preparing for, case studies. This pre-seen, and its associated exams (while aiming to reflect real life), are set in a context where current and ongoing global issues have not had an impact.

Remember, marks in the exam will be awarded for valid arguments that are relevant to the question asked. Answers that make relevant references to current affairs will, of course, be marked on their merits.

Contents

Introduction

Cartn provides the food industry, including beverages, with retail packaging solutions. It supplies packaging materials designed to meet food manufacturers' specific needs. It also offers support in the design and installation of packaging facilities for food manufacturers.

Cartn is one of the world's largest manufacturers of food packaging. It holds many patents for innovative design features.

Cartn is based in Harrland. Harrland's currency is the H$. Harrlandian company law requires companies to prepare their financial statements in accordance with International Financial Reporting Standards (IFRS).

You are a financial manager at Cartn's Head Office. Your primary responsibilities are associated with management accounting and you report to Elizabeth Maenda, the Senior Financial Manager, who reports directly to the Finance Director.

Food packaging

Food packaging can be classified as primary, secondary or tertiary.

Primary packaging 	Primary packaging comes into direct contact with the food product itself. It contains the food and protects it from contamination. Primary packaging can take different forms, including glass bottles, jars, protective film, plastic bags and metal cans. For example, breakfast cereals are often packaged in sealed plastic bags that help to maintain the cereal's freshness.
Secondary packaging 	Secondary packaging is an additional protective layer that surrounds the primary packaging. Its main function is to provide protection for transporting and storing the products. Secondary packaging is often the consumer's initial point of contact with a product. Secondary packaging can also provide a good base for branding products and for printing instructions. For example, breakfast cereal is often packaged in a paperboard box that acts as secondary packaging in addition to the sealed bag used as primary packaging. Boxes are easier to display on supermarket shelves than flexible packaging such as plastic bags and can be more easily printed

	with logos and other graphics that will attract consumers.
Tertiary packaging 	Tertiary packaging consists of containers that are used to ship products, providing both protection and ease of handling. This can range from shipping containers and wooden pallets to corrugated paperboard boxes. Customers are unlikely to see the tertiary packaging that was used to ship their purchases.

Care must be taken when selecting packaging materials for food, particularly in relation to primary materials:

- There can be harmful interactions between some packaging materials and the products that they contain. For example, fruit juice is often acidic, so soft drinks containing fruit juice might react with the metal in an aluminium can. Such reactions can impair a product's flavour and might be harmful to consumers. Packaging can be designed to prevent such reactions. For example, metal cans are usually lined with lacquer to prevent contact between the products and the metal.
- Many products must be protected from environmental factors such as moisture, oxygen or light. For example, biscuits are often wrapped in film that prevents the biscuits from absorbing moisture. Exposure to moisture would soften the biscuits and make them unpleasant to eat. Suitable packaging can extend the product's shelf life.
- Most countries have strict regulations concerning food packaging to prevent the use of materials that have been found to be unsafe.
- Sustainability is an important issue. Excessive packaging or the use of packaging materials that cannot be recycled can affect demand for the product.
- Cost can be an important consideration. Apart from the direct cost of the materials themselves, there could be associated costs associated with transportation. For example, glass bottles are heavier than their plastic equivalents and so they may cost more to transport.
- Presentation must also be taken into account. Customers might find some materials more attractive than others. More attractive packaging could boost demand by creating perceptions of quality. It may also be necessary to print product contents, instructions relating to product storage and preparation, and barcodes on the packaging. Some materials might offer superior clarity for printing.

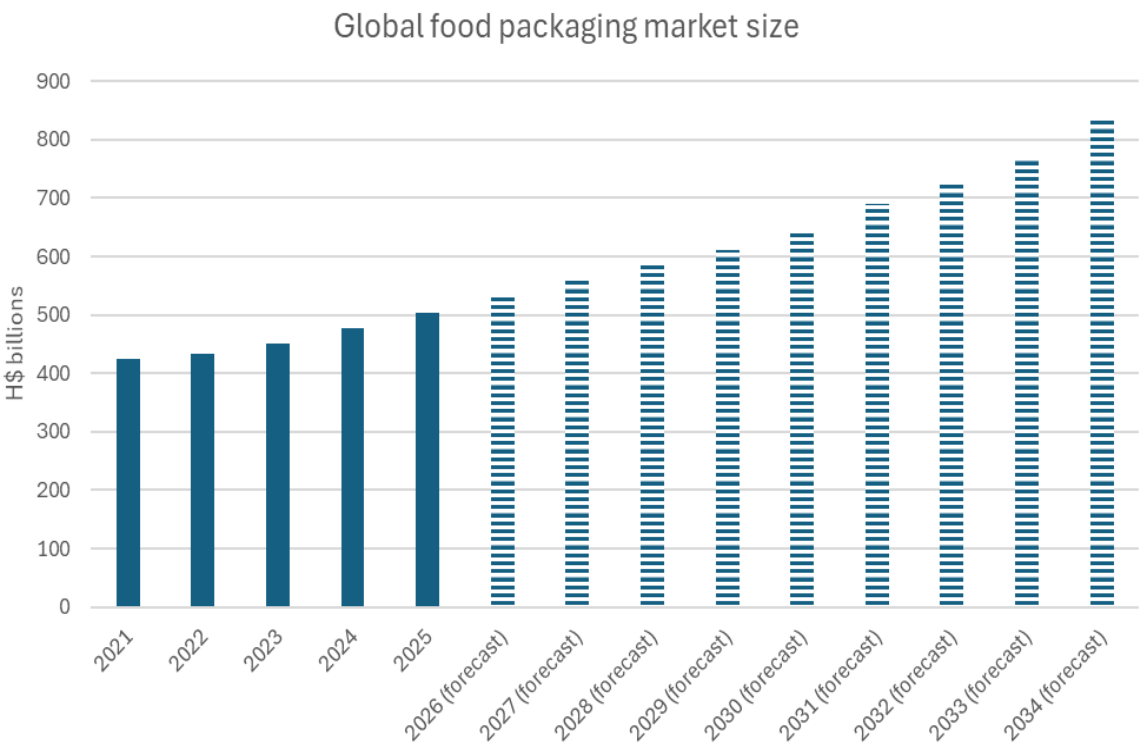
Most of the issues relating to primary packaging also apply to secondary. The main difference is that secondary packaging does not come into contact with the food products and so safety is less of a concern.

Not all products require secondary packaging. For example, products such as muesli and ground coffee are often packaged in plastic bags that are designed to stand upright on supermarket shelves. These products will not be at risk of breaking during storage and handling and so secondary packaging is unnecessary.

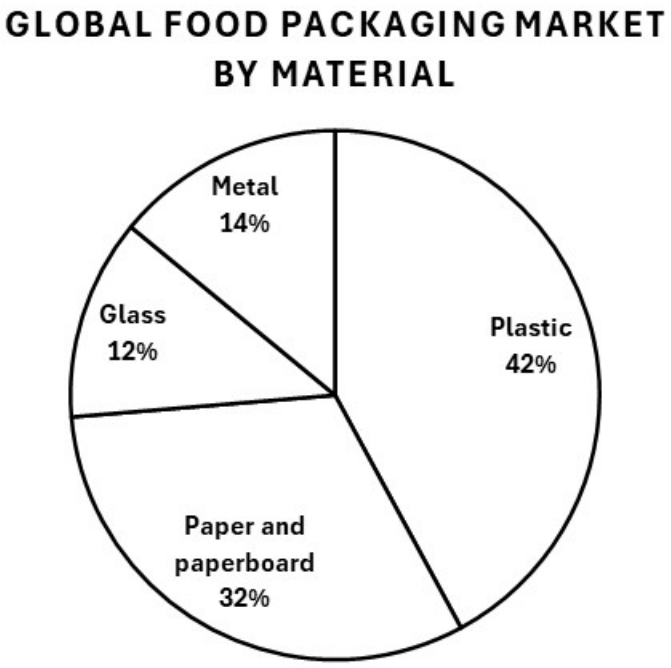
Secondary packaging may be intended to enhance a product's appearance rather than add protection. For example, frozen pizzas are often packaged in plastic wrap. The pizzas could be safely labelled and sold without secondary packaging, but most manufacturers package them in paperboard boxes to make them more appealing.

Tertiary packaging is essentially selected on the basis of logistics. It is generally required to transport goods in bulk and to assist in loading and unloading. Customers will not see the tertiary packaging and so materials may be selected solely with cost and efficiency considerations in mind.

Demand for food packaging is growing steadily. Consumers are buying more packaged food in preference to loose products, such as fruit, vegetables and meat that are sold without packaging or are wrapped at the time of purchase. Packaged foods are generally easier to store and prepare than loose products. Many packaged food products are intended to be heated in their packaging or are cooked and packaged ready to be heated quickly in a microwave oven or a saucepan.



A wide range of materials is used in the manufacture of food packaging:



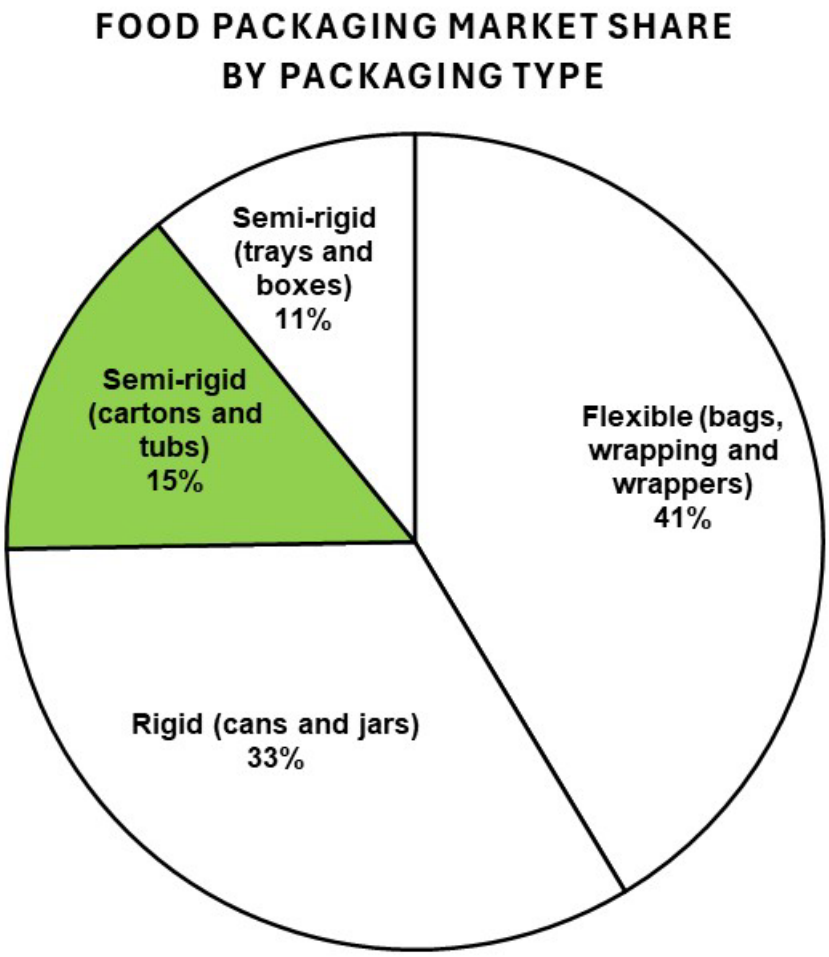
Types of packaging

Food packaging can take many different forms.

Rigid containers	Rigid containers are generally made from materials such as glass or metal. They can protect their contents from crushing.
Cans  	Metal cans can be used to store food for extended periods without any need for refrigeration because they protect the contents from moisture, light and oxygen. Cans are often used to package food that has been cooked and requires only to be heated before consumption. Or they can be used to store products such as fruit that do not require to be cooked or heated. Cans are usually wrapped in printed paper labels that carry branding and other information.
Jars 	Jars are made from glass bodies with metal lids. The lids are airtight when first attached at the factory and so jars can protect their contents from moisture and oxygen, but not light. Jar lids can usually be replaced after the jar has been opened, allowing the contents to be used in small quantities at a time, while it remains fresh. Jars are often used to store products that are neither solid nor liquid, including jam and sauce. The airtight lids also make jars suitable for storing products that will deteriorate if they are exposed to moisture. These include dried herbs and spices and powdered products such as instant coffee.
Flexible containers	Flexible containers are frequently made from plastic or metal foil. Flexible containers are generally cheaper to produce than rigid containers such as cans and jars. They are also lighter, which reduces the carbon footprint associated with the transportation of packaged goods.
Bags and films 	Plastic and metal can be made into bags. These can be designed for ease of opening. Some bags can be opened by pulling the sides apart so that the seals give way. Bags can be designed to be flat bottomed and freestanding or they can be simple pouches that may have to be piled if they are not to be enclosed in secondary packaging such as boxes. Plastic and metal films and foils can also be supplied as rolls of material that can be applied as a wrapping for individual products. For example, frozen pizzas can be shrink wrapped in plastic film. The film can be cut open and removed before the product is heated.

Wrappers  	Some items are wrapped individually in flexible plastic or metal foil. This can be convenient for the sale of, say, chocolate bars to customers who wish to buy a single item as a snack. Manufacturers often provide the option of buying multiple units in secondary packaging, such as boxes or trays. These may be intended for sale through supermarkets and promoted as “family packs”.
Semi-rigid containers	Semi-rigid containers fall between rigid and flexible containers in terms of the physical protection that they provide for products. They usually weigh more than flexible containers, but less than rigid. Semi-rigid containers are often made from plastic or from paperboard.
Trays 	Trays are versatile semi-rigid containers that can consist of plastic or paperboard bases. The trays may be wrapped in plastic or have a sheet of plastic across their tops to retain and protect the contents. The tray can have a single compartment or can have several sections to keep elements of the product separate. For example, a microwaveable curry might have separate sections for the rice and sauce. The plastic used in trays will be thicker and heavier than that used for bags. Trays are often enclosed within cardboard boxes or paperboard sleeves. This secondary packaging reduces the tendency for trays to flex and possibly leak or damage the contents. They are also a useful medium for printing storage and cooking instructions.
Tubs  	Tubs can be made from plastic or layers of paper. They are stronger than trays and may be intended for use in applications that require the packaging to be opened and closed repeatedly. For example, a plastic tub containing butter might have a removeable lid that can be removed and replaced after use, so that the butter can be stored in the refrigerator until it is needed again. Tubs made from layers of paper are frequently intended for use at low temperatures, such as ice cream. Tubs can often be printed with all necessary branding and other information, making secondary packaging unnecessary.

Boxes 	Boxes protect products and can be used to print branding and instructions. Boxes can be used for primary packaging, but they are more likely to be used as secondary packaging, with the food being contained within a bag or wrapping inside the box.
Cartons 	Cartons are constructed from paperboard and layers of aluminium and plastic. These materials are bonded together with adhesive. There are usually two layers of plastic between the carton's contents and the aluminium. That prevents the food from being tainted by dissolving and absorbing the aluminium. The aluminium layer protects the contents from light. The paperboard strengthens the carton, without making it completely rigid. Cartons are often used to package liquids, including milk and fruit juice. Most cartons have plastic caps that can be twisted open like bottle caps. The tops usually incorporate a seal that breaks when the carton is first opened, which makes it possible to tell whether the food might have been interfered with.



Selecting packaging

Food packaging can be produced in-house by food manufacturers, or it can be purchased from third-party suppliers. Packaging food products is usually an integral part of the manufacturing process, with packaged food production lines being equipped to package the food products immediately after they have been made.

Food manufacturers must consider the following factors when selecting packaging:

- The manner in which the product will be stored is important. For example, frozen food must be packaged using materials that will not be damaged by low temperatures.
- The product's preparation is also a consideration. For example, if a product is intended to be heated in a microwave, then the packaging will have to be designed so that it can be microwaved without tainting the food or compromising consumer safety. Some plastics would melt in a microwave oven and would make the food harmful to eat. Metal foils catch fire if they are microwaved.
- The packaging should also be compatible with the food product. For example, plastic bags that are intended to package leafy salad are often perforated to permit some airflow through the product, which reduces condensation inside the bag. Suitable packaging can extend the product's shelf life.

- Packaging should make food products visible alongside rival brands and should be attractive to consumers.
- Food packaging must comply with legislation and other regulations, both in relation to food safety and sustainability. Food manufacturers should consider whether their packaging can be recycled. If it cannot be recycled, then it should at least be biodegradable.
- Some products require aseptic packaging, which involves the sterilisation of both the food and the container before the food is packaged. This occurs in a sterile environment. Bacteria can cause food to deteriorate, so their elimination can extend product shelf life, possibly avoiding food waste. In some cases, aseptic packaging eliminates the need for food to be refrigerated while the packaging remains unopened. Aseptic packaging can also protect consumers from food poisoning.

There is a buoyant demand worldwide for packaging. Customers are, however, increasingly concerned about sustainability and the safe disposal of used packaging.

Cartn

Cartn was founded in 1960. The food industry was at that time changing significantly, with growing emphasis on the sale of processed and packaged foods. Cartn's founders were engineers who had ambitious plans for the development of new and improved packaging techniques.

Cartn was quoted on the Harrlandian Stock Exchange in 1978. Its founders sold their remaining shares and left the company in 1983.

The company has two main sources of income:

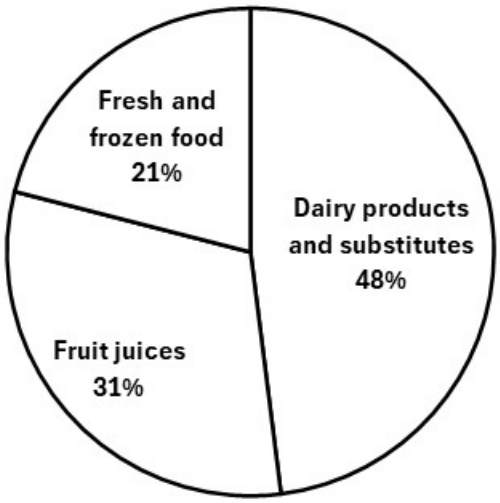
- manufacturing
- consultancy

Manufacturing

Cartn is one of the six largest manufacturers of cartons and tubs, employing 23,000 employees in 27 factories around the world. It supplies a wide range of food manufacturers, who require a reliable source of good quality packaging for their products.

Cartn supplies food manufacturers in the following categories:

CARTN
MANUFACTURING SALES BY REVENUE



Cartn specialises in the manufacture of cartons and tubs for use as food packaging.

Cartn is a major supplier of cartons and tubs to companies who sell fresh and processed milk and milk substitutes.

- Fresh milk can last for up to 21 days after it is pasteurised, provided it is kept refrigerated in its carton. Cartons of fresh milk are transported in refrigerated vehicles, displayed on refrigerated cabinets in shops and then kept in customers' refrigerators until the milk has been consumed.
- Milk can also be processed using an aseptic process that creates Ultra-High Temperature (UHT) milk. That involves heating the milk to 135 degrees centigrade for a few seconds to kill most of the bacteria before it is packaged in sterilised cartons. UHT milk can then stay fresh for up to six months without refrigeration, provided it is not opened. After opening, UHT milk will remain fresh for 3-5 days in a refrigerator.
- Dairy manufacturers also require tubs for some dairy products such as yoghurt. Cartn supplies both plastic and paper tubs.
- Some customers require cartons for dairy substitutes. These include milk substitutes manufactured from plant-based ingredients including soy, almond and oats.

Cartn also supplies cartons for fruit juices. These are similar to the cartons used for packaging milk.

Cartn supplies a range of tubs used as food packaging, primarily chilled and frozen foods including ice cream. These can be made from plastic or layers of paper.

All of Cartn's packaging is supplied in standard sizes, such as 1 litre, 0.5 litre and 0.2 litre.

Larger cartons are primarily intended for sale through supermarkets. Smaller cartons are often sold as individual portions through shops or takeaway food outlets. They can be supplied with straws for convenience.

Cartn's customers generally place frequent orders. Doing so ensures they have sufficient packaging on hand to avoid disruption of their production schedules, without needlessly tying up cash in excessive inventory.

Cartn provides customers with software that enables them to design the graphics and text that are to be applied to their packaging products. Those designs are emailed to Cartn and are used to ensure that all packaging is printed to customers' exact specifications.

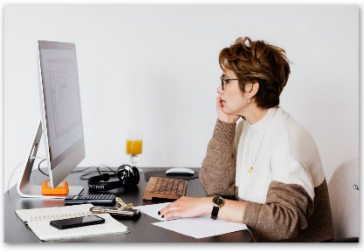
Cartons are supplied as rolls of laminated materials and separate plastic caps. Customers' production lines have machinery that folds the material into cartons, sealing all seams so that they are leakproof. Most cartons are fitted with sealed plastic caps that can be opened and reclosed. The cap is sealed with a plastic strip that prevents spills and reduces the risk of contamination before the carton is opened. The plastic strip is detached when the cap is first opened, so retailers and consumers can inspect the strip to check that the product has not been interfered with before opening.

Cartn's tubs are preformed before they are shipped to the customer, with separate supplies of lids. The shapes of the tubs and lids make it possible to stack them for efficient shipping.

Customers' production lines are designed to fill the tubs and attach their lids. There may be production processes to be completed between the tub being filled and the lid being attached.

Consultancy

Cartn provides a consultancy service to design and install packaging equipment that is compatible with the cartons and tubs that it sells. Customers are often keen to use Cartn's expertise in the design of processes for filling tubs or cartons, making them ready for despatch.



The consultancy service employs 800 design and technical staff who are based in six offices around the world.

Clients who wish to use this service must brief Cartn's design team in relation to the product that is to be packaged. The design team must allow for the specific nature of the food products that are to be packaged, including:

- Will the packaging take the form of cartons or tubs?
- What sizes of cartons or tubs will be used?
- What will be the food's temperature when it is packaged?

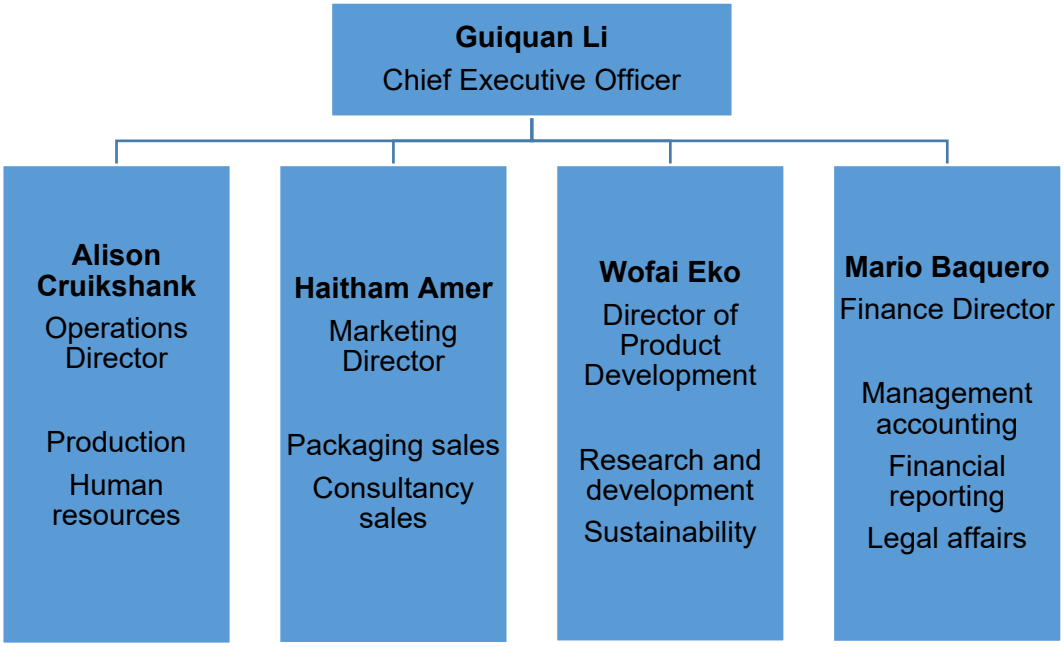
Cartn's engineers design packaging systems that are compatible with clients' production lines. In many cases, the new packaging system will be required to replace an existing system that is either worn out or obsolete.

Cartn provides an advisory service. It does not make or supply its own equipment, nor does it offer installation. Clients are provided with detailed recommendations, listing specific manufacturers and models. The clients are able to order the specific equipment identified as

suitable by Cartn's engineers. Cartn does not install equipment, but it does provide plans to assist client staff or third-party technicians with the installation of the equipment after delivery.

Consultancy contracts are priced on the basis of the estimated time required to complete the design work and the seniority of the engineers assigned to the engagement. Any cost overruns are either charged to the client or are borne by Cartn, depending on the cause of the overrun.

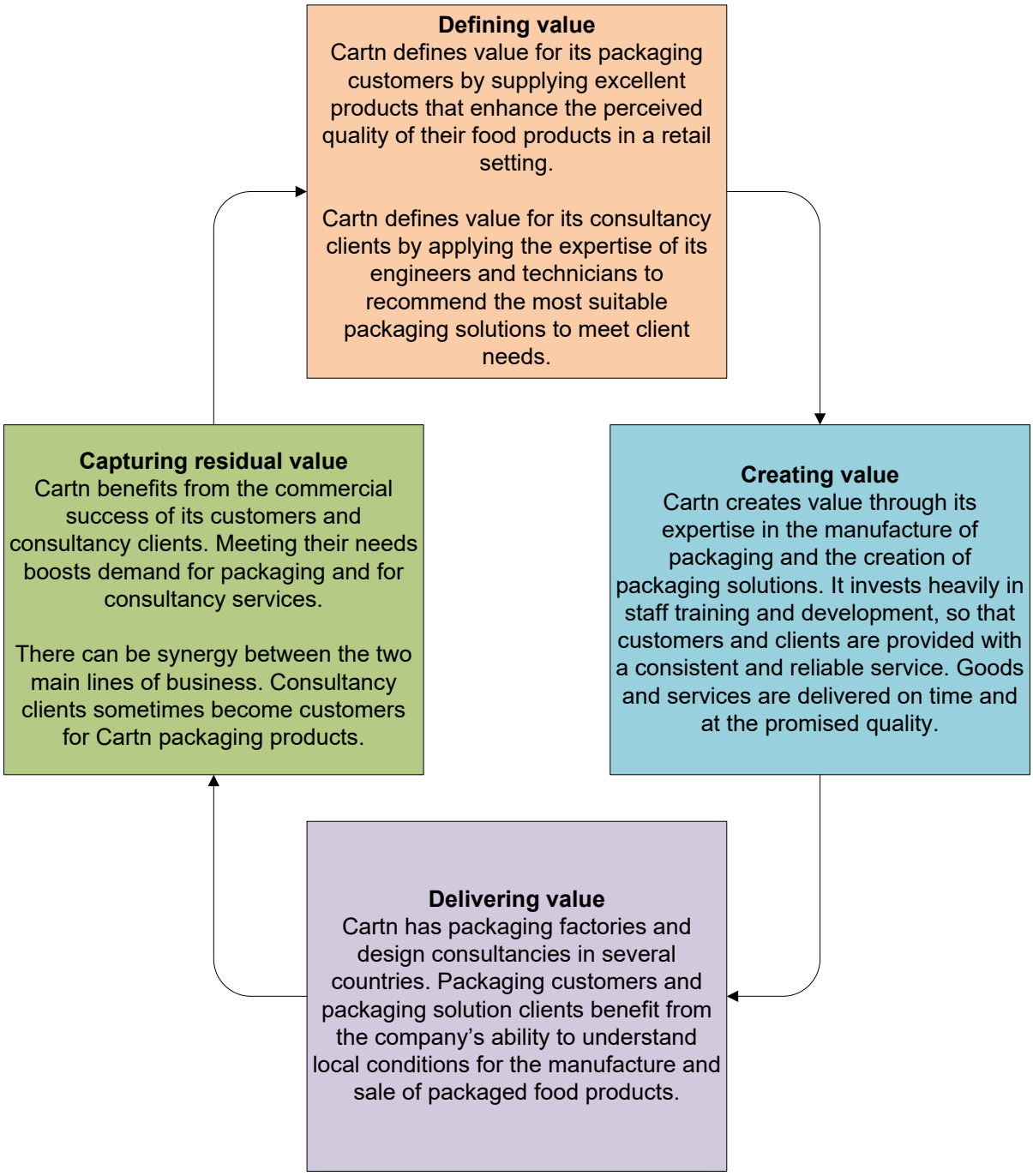
Cartn's Board structure



Cartn's Board also includes four non-executive directors:

- Evelyn Koay – Non-Executive Chair
- Kevin Morris
- Orna Yosef
- Philippe Benoit

Cartn's business model



Extracts from Cartn's annual report

Cartn Group Consolidated statement of profit or loss For the year ended 31 March	2026 H$ million	2025 H$ million
Revenue	1,236.2	1,149.7
Cost of sales	(964.2)	(919.8)
Gross profit	272.0	229.9
Administrative expenses	(132.0)	(138.0)
Operating profit	140.0	91.9
Finance costs	(12.3)	(12.9)
Profit before tax	127.7	79.0
Tax	(16.6)	(10.3)
Profit for year	111.1	68.7

Cartn Group Consolidated statement of changes in equity for the year ended 31 March 2026	Share capital and premium H$ million	Currency reserve H$ million	Retained earnings H$ million	Total H$ million
Balance at 1 April 2025	45.0	(24.3)	332.8	353.5
Exchange differences		9.6		9.6
Profit for the year			111.1	111.1
Dividends			(87.8)	(87.8)
Balance at 31 March 2026	45.0	(14.7)	356.1	386.4

Cartn Group Consolidated statement of financial position As at 31 March	2026 H$ million	2025 H$ million
Non-current assets		
Intangible assets	142.6	142.6
Property, plant and equipment	258.1	249.8
	400.7	392.4
Current assets		
Inventory	114.9	110.8
Trade and other receivables	133.4	127.7
Bank	25.8	19.7
	274.1	258.2
Total assets	674.8	650.6
Equity		
Share capital and share premium	45.0	45.0
Currency reserve	(14.7)	(24.3)
Retained earnings	356.1	332.8
	386.4	353.5
Non-current liabilities		
Loans	154.3	161.7
Current liabilities		
Trade and other payables	117.8	125.2
Tax	16.3	10.2
	134.1	135.4
	674.8	650.6

Sustainability

Governance	Cartn's Board accepts full responsibility for the sustainability of Group operations. The Director of Product Development has a specific responsibility for the oversight of all strategic matters relating to sustainability and is expected to keep the Board informed of all sustainability-related matters arising from operations and the implications for sustainability of any proposals that are under discussion.
Strategy	Food packaging requires the use of packaging that maintains the freshness of food and protects consumers from contamination. The manufacture and sale of tubs and cartons create challenges in relation to sustainability: • Cartn's products require the use of paperboard, aluminium and plastic. Sourcing these materials can be inherently unsustainable. • Cartn's products are made from laminated layers of different materials, which can complicate recycling of used packaging. Cartn addresses these concerns to the best of its abilities: • Most of Cartn's tubs use paperboard lids instead of the plastic that was previously used. • Cartn's paperboard is purchased from suppliers who can demonstrate that they source wood in a manner that encourages biodiversity. • Cartn is working on changes that will make its products easier and more efficient to recycle.
Risk management	Cartn has a sustainability committee that comprises senior managers from each functional area. The committee's responsibilities include the preparation and interpretation of routine reports on sustainability. Department heads receive regular sustainability reports on the performances of their departments. They are required to report to the Sustainability Committee if they fail to achieve targets.
Metrics	Cartn has been working on reducing the greenhouse gas emissions associated with its manufacturing processes. The average emissions per carton produced are now 24.0 g CO_2e. That is a significant reduction from the 2015 figure of 35.0 g CO_2e.

Extract from Valboxx's annual report

Valboxx is one of five major rivals to Cartn in the manufacture of cartons and tubs. Valboxx manufactures cartons and tubs, focussing on similar markets to Cartn's. Unlike Cartn, Valboxx concentrates on manufacturing. It does not offer a consultancy service.

Valboxx Group **Consolidated statement of profit or loss** **For the year ended 31 March**	**2026** **H$ million**	**2025** **H$ million**
Revenue	1,322.7	1,243.3
Cost of sales	(983.5)	(934.3)
Gross profit	339.2	309.0
Administrative expenses	(119.0)	(111.9)
Operating profit	220.2	197.1
Finance costs	(12.9)	(13.4)
Profit before tax	207.3	183.7
Tax	(26.9)	(23.9)
Profit for year	180.4	159.8

Valboxx Group **Consolidated statement of changes in equity for the year ended 31 March 2026**	**Share capital and premium** **H$ million**	**Currency reserve** **H$ million**	**Retained earnings** **H$ million**	**Total** **H$ million**
Balance at 1 April 2025	50.0	(21.1)	386.4	415.3
Exchange differences		4.7		4.7
Profit for the year			180.4	180.4
Dividends			(140.9)	(140.9)
Balance at 31 March 2026	50.0	(16.4)	425.9	459.5

Valboxx Group **Consolidated statement of financial position** **As at 31 March**	**2026** **H$ million**	**2025** **H$ million**
Non-current assets		
Intangible assets	151.2	151.2
Property, plant and equipment	302.1	289.9
	453.3	441.1
Current assets		
Inventory	147.5	130.8
Trade and other receivables	117.1	111.0
Bank	22.8	19.6
	287.4	261.4
Total assets	740.7	702.5
Equity		
Share capital and share premium	50.0	50.0
Currency reserve	(16.4)	(21.1)
Retained earnings	425.9	386.4
	459.5	415.3
Non-current liabilities		
Loans	161.3	168.1
Current liabilities		
Trade and other payables	93.2	95.3
Tax	26.7	23.8
	119.9	119.1
	740.7	702.5

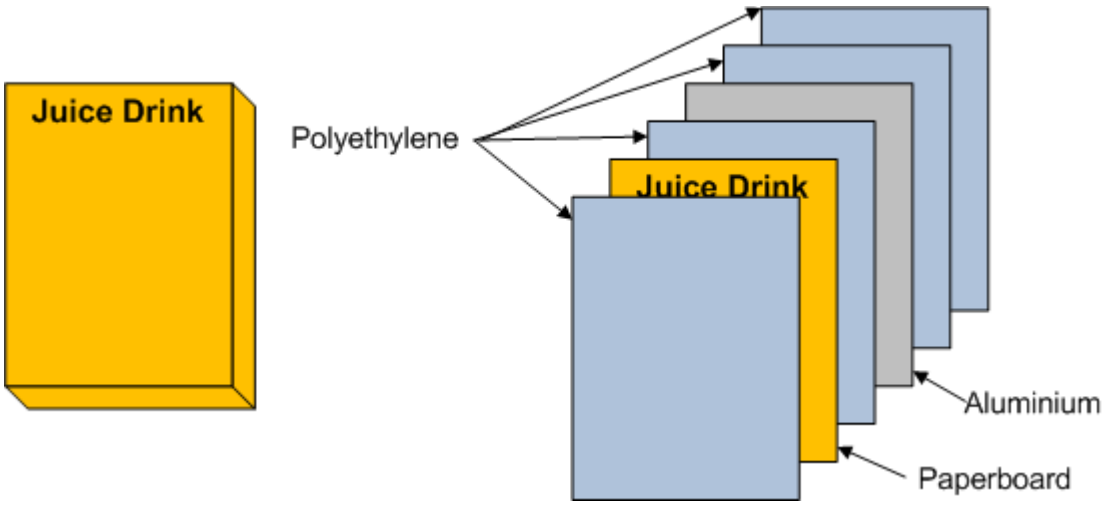
Happy Comic

Readers' questions

Question: What are drinks cartons made of? They look like paper, but when you pick one up it feels like plastic. If you cut one open, it is shiny inside.

Thomas, age 11

Answer: Your drinks cartons are made out of layers of different materials. It would be both difficult and expensive to make a safe and effective carton out of a single layer of material.



The paperboard is the thickest layer. It is usually printed with information about the product.

The polyethylene is a plastic that is used to protect the other layers. The polyethylene outer layer prevents the paperboard from being damaged by any liquid that is spilled on it during storage. The inner layers prevent the aluminium from damaging the food inside the carton. They also help to guard against bacteria.

The aluminium blocks out light, which would encourage the growth of bacteria, and so it helps to keep the contents safe to eat or drink. The aluminium makes the inside of the carton look shiny when you cut it open.

Question: I persuaded my parents to start buying drinks in cartons rather than in metal cans because I wanted us to be more sustainable. But I learned from a school project that cartons cannot be recycled easily. Should we go back to cans?

Mara, age 12

Answer: It was encouraging to read that you are working to make your family more sustainable.

The question of whether your cartons can be recycled depends on the local government in your area. Most local governments are prepared to accept cartons for recycling, but some are not. Those who do can separate and repurpose the materials that are used to make cartons.

Cartons are made from layers of paperboard, aluminium and plastic. The most common approach to recycling involves separating the paperboard from the other materials. The paperboard is then pulped and can be used to make paper. The plastic and aluminium are not separated, but they can be used as ingredients for building materials in their combined state.

If your local government does not have the facilities to recycle or repurpose cartons then, sadly, the cartons will have to be disposed of as household waste and will be dumped in a landfill site. That is basically a large pit in which waste is buried and left to decompose. Some waste, including cartons, takes many years to decompose.

Harrland Business News

Real recycling requires circularity

Recent research published by the University of Central City suggests that many consumers confuse repurposing with recycling. That can create a false impression of the sustainability of a particular company's products.

Recycling involves the recovery of materials in order to return them to their original state for reuse. For example, clear glass can be melted down and used to make new glass products. Similarly, metals can be recycled. Other materials that can be recycled include paper and metal.

Product design plays a large part in recycling. It must be possible to separate the individual materials, otherwise the different items will contaminate one another.

Repurposing involves the creation of something useful from a product that has reached the end of its useful life. For example, plastic bottles can be repurposed to make different products such as building insulation. Doing so is preferable to dumping the bottles in landfill, but it does mean that new fossil-based plastic must be sourced to replace the bottles that have been used and then converted into insulation or whatever. Repurposing makes it difficult to track the sustainability of the products that are repurposed because it can be difficult to measure the proportion of materials that have been put to good use.

Harrland Daily News

A career as a design engineer

Most companies are constantly innovating in the race to develop new and improved products. Innovation requires a number of skills, including the vision to come up with new ideas and the ability to identify ways in which existing products can be upgraded to enable them to remain competitive.

Design engineers play a crucial role in this process. They assist senior management by creating models that can be used to ensure that the end product will be viable. Those models could take the form of designs drafted using computer-aided design software on a computer. A drawing could answer a question such as whether all of the parts will fit inside the product.

Design engineers also create physical models, often referred to as “prototypes”. Some prototypes are created as working models that enable senior management or potential customers to see what the finalised product will be capable of. Others may simply be designed to look and feel like the finished product. In any case, they will be several steps removed from the mass-produced products that will eventually roll off the production line.

Founded by AICPA® and CIMA®, the Association of International Certified Professional Accountants® powers leaders in accounting and finance around the globe.