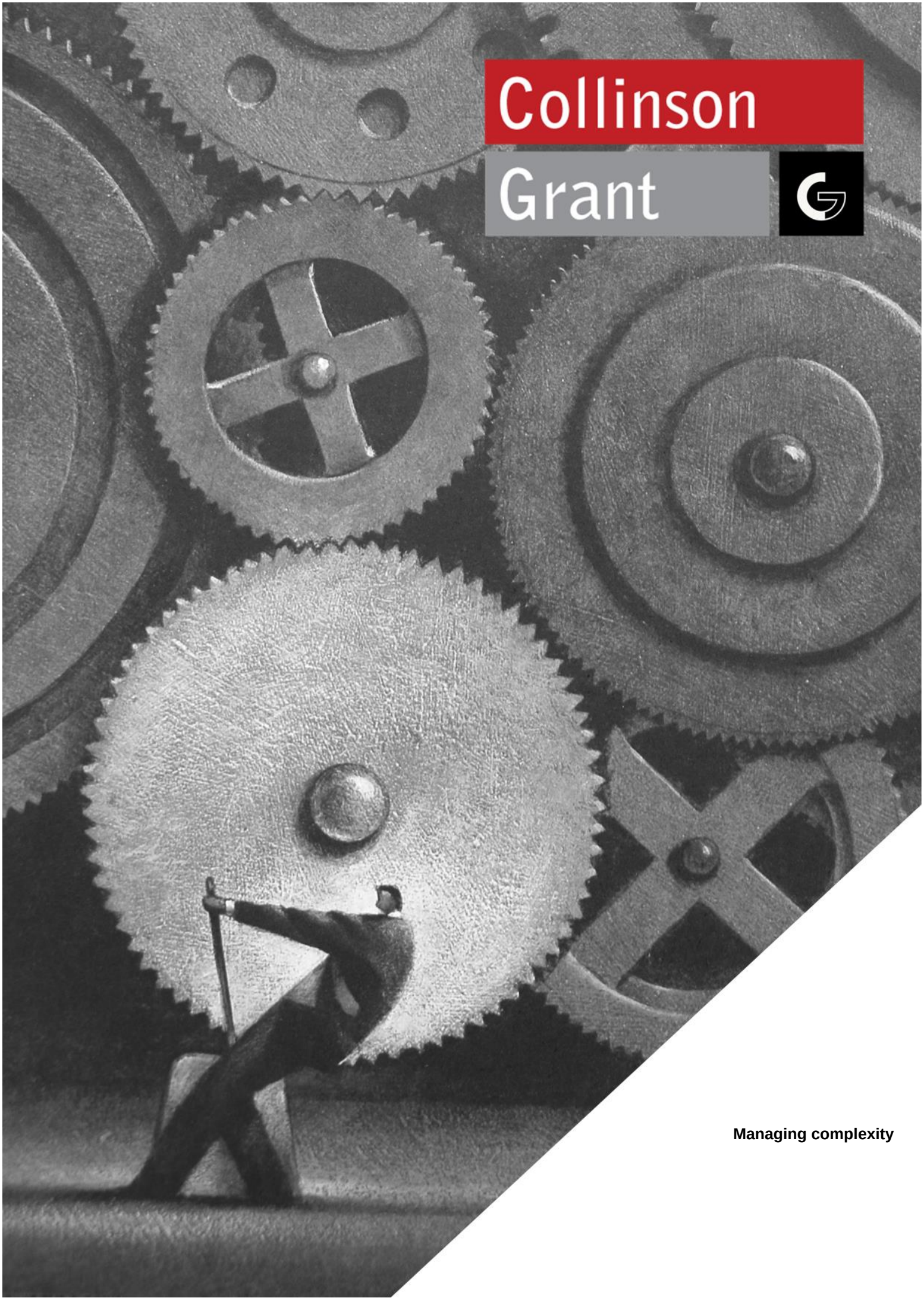


Collinson Grant

Managing complexity

Contents

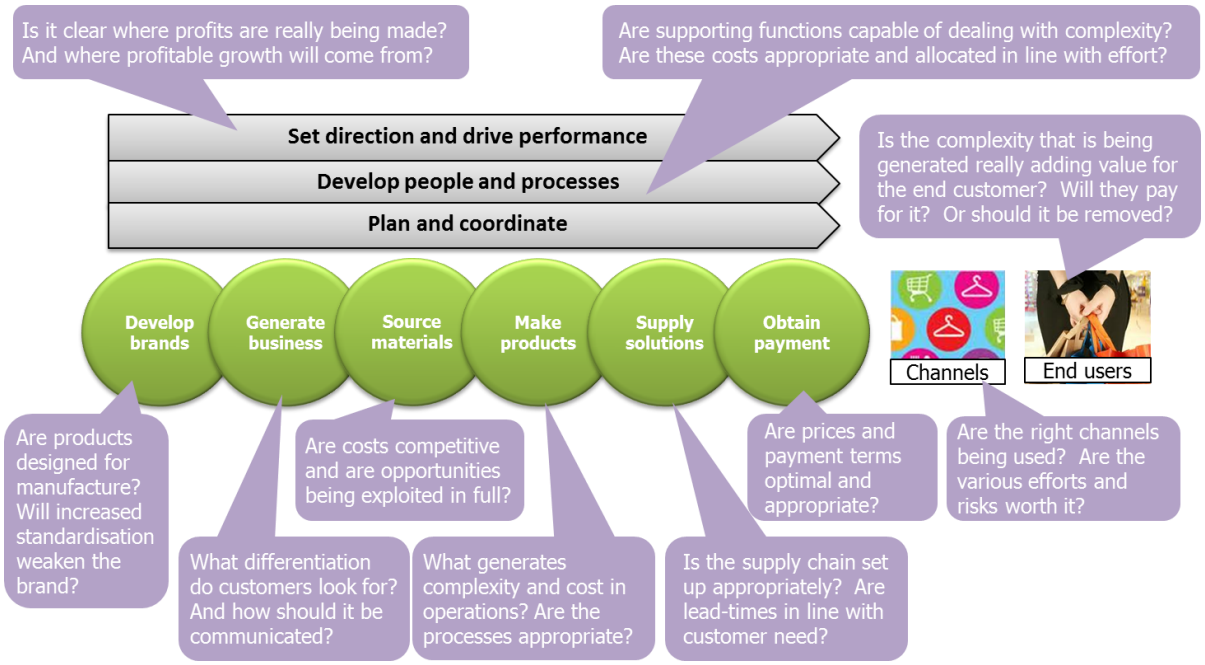
1 Getting the right people involved to manage complexity

Complexity in business arises from the diversity of markets, customers, products, processes, components (parts or materials) and suppliers that a company chooses to deal with. Most managers recognise that complexity comes at a cost – both in activities and overhead. But to be competitive, it is important to understand where and how the market rewards differentiation, and to root out all complexity that cannot be justified.

Complexity can hinder the performance of supply chains and the proliferation of products can lead to excessive set-ups and costs during manufacture. Errors in forecasting can be magnified which may increase the chance of stock-outs and drive up the costs of distribution. But the answer is not to simply cull products indiscriminately from the range. Companies need to balance the costs of complexity with how the market values variety.

Many low-volume products lose money after the associated costs of complexity are accounted for. And some products thought to be adding complexity are quite profitable, because they generate high margins. It may appear tempting just to eliminate 'the tail' of the portfolio of products. But the answer lies in understanding the inter-dependencies within the portfolio and pinpointing the trade-offs between the requirements of the market, revenues, costs, and stakeholder ambitions for growth. People from Marketing, Sales, Development, Supply Chain and Manufacturing have different perspectives on what needs to be done. Only by collaborating can complexity be reduced and contained.

Chart 1: Consideration of complexity in the value chain



2 Optimising choice and profit (and surviving attack)

Companies are vying to satisfy customers and end-users of their products while maximising profits. Managers face several challenges in attempting to balance choice (and complexity) with performance:

- Managing an ever-evolving range and the phasing-in or phasing-out of products – The need to keep ahead of (or at least in pace with) the competition encourages some fast-moving consumer goods (FMCG) companies to introduce new stock-keeping units (SKUs) every few months. This pace in innovation can be crucial for sustaining both

retailer and consumer interest. And deciding which SKUs to keep, push or phase-out will determine market share.

- Catering to different budgets and entering new markets – Eastern Europe, Asia, Africa and South America provide growing markets to support expansion, but can also bring additional complexity. Smaller packs are increasingly popular in some of these markets. But with continued pressure on household budgets in established Western markets, consumers are looking for more affordable alternatives – which may involve bulk purchases. Building a supply chain to meet all these needs profitably can be tough.

- Attracting more of the consumers' spend – As companies look to defend and grow market share, they may choose to attract existing customers with additional products. However, this is likely to add complexity on top on the existing range – such as new formulations and materials.

In pursuit of these aims, businesses can find themselves with an unnecessary proliferation of products and an increase in complexity throughout the supply chain. Some of the cost drawbacks are obvious, such as an increased number of set ups and shorter runs that are detrimental to efficiency on the production line. But some of the costs of complexity are less transparent and more insidious: multiple designs can require additional support, production lines and warehousing space (testing, moulds and bespoke equipment, et cetera); the diversity of materials can decrease negotiation strength with suppliers; and multiple SKUs increase the likelihood of erroneous forecasting and its associated costs (fragmented shipping, expediting finished goods, et cetera).

The biggest danger for any company comes when the commitments made in managing this complexity create a cost-base that prevents it from competing effectively. Some businesses survive on a few high-volume, standard products that are 'the backbone of the portfolio' and provide the majority of profits. (In some cases, it is a clear leading or benchmark product in the market that defines the standard.) And, if managed correctly, these 'standards' (in terms of materials and design) should be used for the numerous smaller-volume ('follower') products in the portfolio. When the market is stable, this strategy can look attractive. But when a competitor with a better portfolio attempts to attack the largest contracts, a management team has only three options:

1 to ignore what is happening and hope the competitor fails (which is unlikely if they are determined and have lower costs)

2 to 'run away' and chase more small contracts – in the belief that they will fill the gap. This risks moving the business to an even weaker competitive position as a consequence

3 to 'turn and fight' – by taking conscious (and swift) action to cull the tail of products, remove significant cost and increase competitiveness to help retain the larger contracts.

This is why a thorough understanding of complexity and the true costs (assets and resources) associated with it, is a vital first step in taking action.

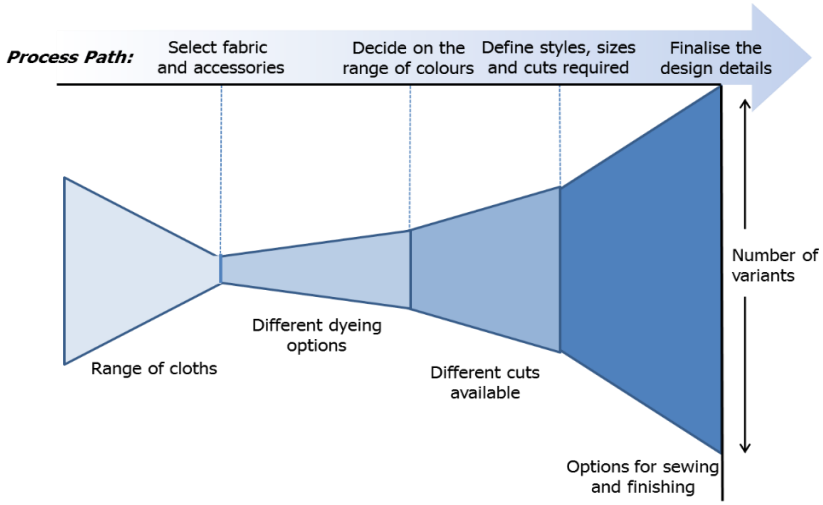
Once the tail of products has been culled and sufficient costs removed, this will create the conditions – both in terms of capacity and in the cost-base – from which to launch a successful counter-attack. But if products are cut and the cost-base is not reduced sufficiently, then the business will struggle to maintain profitability during this strategic manoeuvre.

The Senior Team must decide if and when to cull. Commercial must propose what should be culled. And Operations must make its best effort to cut costs (quickly) so that such a strategy succeeds.

3 Spotting complexity and understanding its true cost

First, it is important to understand where variety emanates from in the supply chain and how it can lead to complexity. A 'product variety funnel' is a useful way to begin visualising this.

Chart 2: A product variety funnel for a manufacturer of clothing

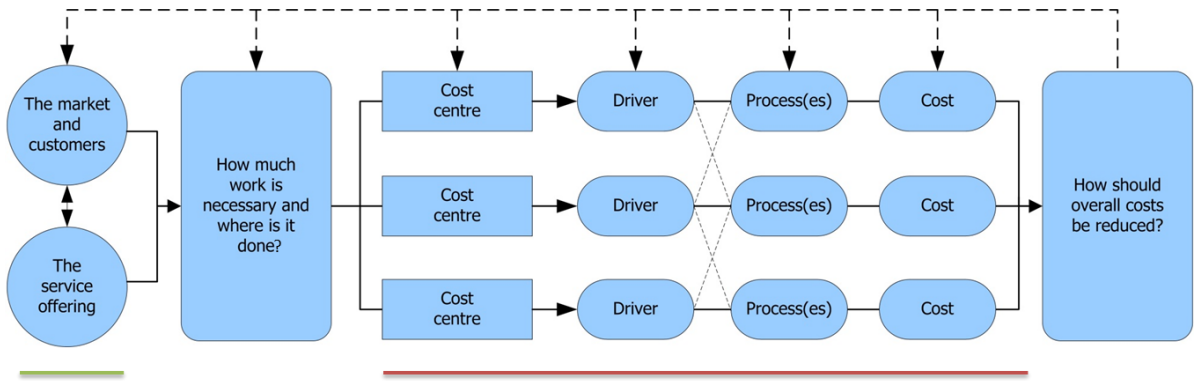


The product variety funnel helps:

- to pinpoint the increase in variation that is generated along the supply chain from raw materials to finished goods
- to highlight where in the process the best opportunities may be to reduce and control complexity (as well as inventory and cost).

But much better data are needed to make informed decisions. The drivers of complexity and the associated costs must be analysed thoroughly. This involves digging deeper into the processes and costs of your business to understand where, when and why complexity arises. When it comes to direct materials used in production, allocating costs and understanding them is fairly straightforward. But it is when you turn attention to indirect and overhead cost that the task becomes harder. To do this effectively, the notion of fixed and variable costs must be treated as irrelevant. All costs should be seen as variable (as, in reality, they are!).

Chart 3: Analysing the drivers and costs of complexity



Market imposed requirements and company controllable decisions

Focus for understanding the costs of complexity

In financial accounts, the profitability of separate products is often hidden at the operating level (after accounting for just the obvious direct costs). Allocating costs classed as 'indirect' or 'overheads' to activity, permits managers to drill-down and conduct analysis that can be revealing. There are several steps to constructing a view of where complexity arises in the business, why, and at what cost:

- Understand how activities consume cost
  - ➤ Think of the various stages of your process, using the product variety funnel to help understand where variation is coming from.
  - ➤ Break down processes into discrete activities to be linked with different drivers of cost as appropriate.
- Define relevant (and available) drivers of cost
  - ➤ Decide on a range of drivers of cost for which data are readily available. Although these may not always be a perfect match, the idea is to assess the behaviour of costs as accurately as is feasible – not to incur new costs to take measurements!
  - ➤ Pick drivers of cost that are easily understood – if they are too abstract it will undermine support for the method.
- Assess the costs of those activities
  - ➤ Link the costs of each specific activity to a driver. Pool them if necessary to simplify allocation. And challenge any element of cost that is claimed to be 'fixed'.
  - ➤ Understand the behaviour of costs in relation to each cost driver in turn – considering this for each channel, customer, category and product.
- Create a plan
  - ➤ Find those products and services that are not core and which consume excessive cost (relative to price). Set priorities for increasing prices and/or accelerating withdrawal. Or consider if they would be good candidates for subcontracting.
  - ➤ Challenge and agree on the need for maintaining selling prices for those products of strategic importance.
  - ➤ Understand the true costs for products and services with special features – 'specials' invariably incur more overheads than are often reflected in the price, so re-price them accordingly!
  - ➤ Pinpoint opportunities to cut costs selectively without jeopardising the investment in resources for those elements that are performing well.

Spotting and understanding the true cost of complexity is a crucial first step. But there will always be a requirement to provide variety at a competitive price, so finding ways to accommodate complexity needs consideration.

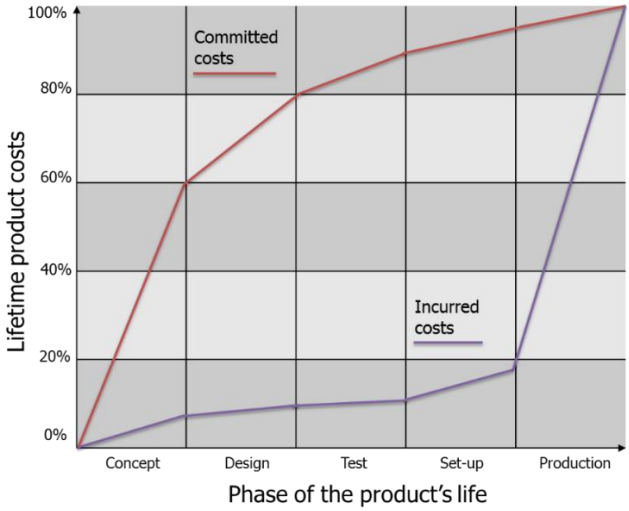
4 Designing with simplicity in mind

In our experience, the primary source of complexity is not usually from customers or consumers, but from the organisation itself. And the best point to tackle this is during the design of a new product. Factoring the avoidance of complexity into the design can represent a powerful alternative to simply cutting the number of SKUs further down the line. The challenge is to

commit sufficient focus during the design phases (whilst also reducing elapsed time) to ensure that the long-term costs of manufacture are minimised.

With circa 60% to 80% of a product's manufacturing costs determined at the design stage (Chart 4), 'design for manufacture' is a practice which can bring significant competitive advantage. It emphasises the potential manufacturing challenges a product might generate while it is still in the development stage, so that alternatives can be explored.

Chart 4: How much of the overall cost is determined during design



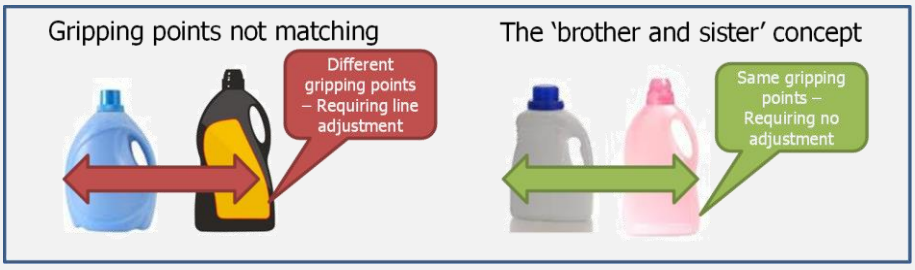
Design for manufacture accommodates complexity whilst maximising line efficiency:

Work collaboratively – Many businesses rely on manufacturing departments to reduce complexity and the cost of goods sold once they are in production. This is a mistake! High performing organisations make the reduction of complexity a company-wide effort during the development phases. The inputs from Marketing, Sales, Design, Development, Manufacturing and Supply Chain are all needed to assess what can be done to reduce complexity in manufacturing without compromising on the success of the product.

Systematically reduce the number of components and design multi-functional parts – Proliferation of components raises cost. It leads to multiplication of suppliers, inventory, handling, assembly, quality inspection, et cetera. Unique parts with no links to other products should be a prime target for elimination. And parts should be designed so that they can serve multiple purposes and be used in numerous products.

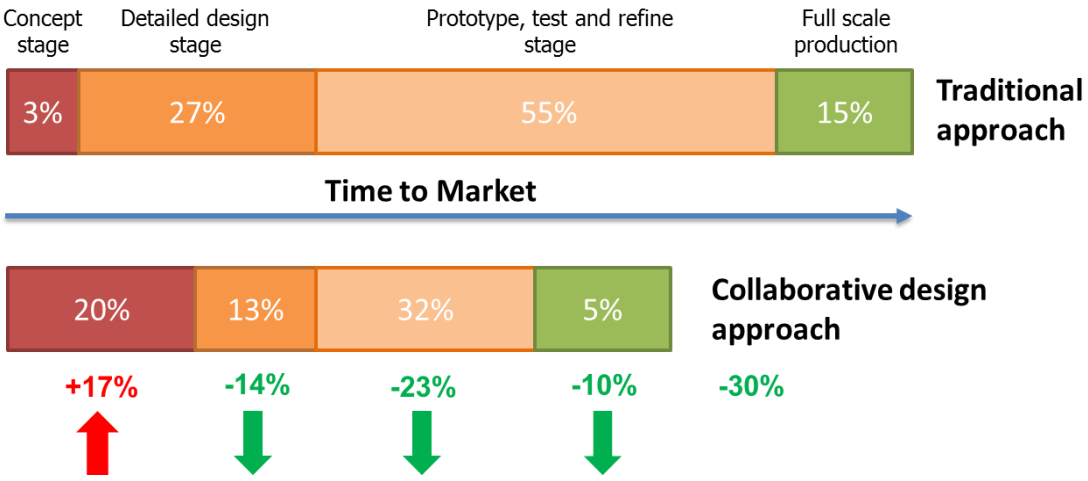
Build modularity into both the product and the process – Just as some products can be designed effectively into modules, the versatility of the manufacturing process can also be improved by enabling changes to be made in sections. This avoids the requirement for a complete rethink or overhaul at each design change, and enables improvements to be made much more easily to discreet elements of the process.

Maximise efficiencies using the 'brother and sister' concept – By designing different variants of packaging that comply with the same equipment settings on the production line, a manufacturer permits variation without compromising efficiency.



When design for manufacture is embraced, the collaborative and concurrent nature of the early phases can provide other benefits – including a significantly reduced time to market.

Chart 5: The reduced time to market from using design for manufacture



5 Balancing efficiency with responsiveness of supply

Once the design of the product is set out, organisations must assess the kind of supply chain they need to meet customer needs while minimising the impacts (and costs) of complexity. Although it might be tempting to define excellence as always offering a 'best in class' service, it does not necessarily follow that all customers want or truly require such a service. Different supply chain models will incur different costs. And there will be a trade-off between responsiveness and efficiency.

Chart 6: Responsive versus efficient supply chains

A 'responsive' supply chain aims to respond to the market by flexing fully to meet highly variable and unpredictable demand; to minimise stock-outs without risking obsolescence	An 'efficient (low-cost) supply chain aims to maximise efficiency by providing service at the lowest total cost
• To maintain an excess buffer of capacity and to accept low use of capacity (stock is risky, so a fast response requires capacity to be kept available	• To make full use of manufacturing facilities • To create a 'pull' throughout the supply chain in response to customers' demand
• To accept low accuracy in forecasting	• To maintain predictable demand
• To set prices for high margins	• To accept low margins and to focus on the lowest cost
• To slash lead times	• To trim lead times, as long as that does not add costs
• To use buffer stocks of materials and finished goods	• To minimise inventory
• To integrate with suppliers, who aim to be flexible • To mark products down and manage disposals (to clear stocks)	• To instigate vendor managed inventory (VMI) and continuous replenishment (CRP) at each stage of the supply chain

A good place to start is by agreeing the characteristics and measures of performance (such as lead time, availability of inventory, minimum size of order, et cetera) that are required by the target customer. Ultimately, this will pre-determine much of the cost and characteristics of the supply chain. The answer is likely to be a balance between efficiency and responsiveness.

6 Controlling variation at source

Once an organisation has grasped what the drivers of complexity are, stemming it at its root should then become the priority. Although this concept is simple, the journey to get there is not. To make it happen, a multi-functional team must:

- Develop and enforce a clear set of rules – Product category and customer plans should be set out to include clear rules on what is to be permitted (minimum quantities, range of colours and shapes, where variants are to be allowed, et cetera) to which customers.
- Embed them within existing processes – Consideration of complexity must take place early in the design and quotation processes. To make this happen, roles and responsibilities must be clearly defined and, if required, stage-gates introduced to enforce compliance by all involved.
- Implement tools for sharing knowledge and measure compliance – Complexity can arise simply because of a lack of visibility. At a consumer products company we worked with, a 'packaging database' (a repository of live packaging items) was seen an important enabler – both for stopping unnecessary variants and as a way to communicate the rules. It would allow this company to track compliance and monitor complexity through a simple set of KPIs.

7 Removing proliferation and extracting costs

If thorough controls on complexity are not in place or not enforced, then (regular) rationalisation of the product portfolio becomes a necessary evil. But the real difficulty when doing this is in eliminating associated costs, so that profits are improved. When making a substantial cull in products, as much as 75% of the associated costs may need to be actively 'managed out' (or else profits will be damaged).

Chart 7: The need to actively 'manage out' costs when making a cull

Costs that would 'fall out with a reduction in products/volume: 20-30%	Costs that would need to be excluded from budgets to ensure that the benefits were achieved: 20%-30%	Costs that would need to be actively 'managed out': 45% - 55%
• Shunting costs • Outside warehouse storage • Obsolete finished goods and unique materials • Inventory would also be reduced with a cull: finished goods, materials unique to the product	• Direct manufacturing costs (from changeover reduction), including overtime and agency • Indirect (and direct) utilities • Maintenance • Logistics	• Indirect factory overhead (labour) • Indirect central overheads • Warehousing

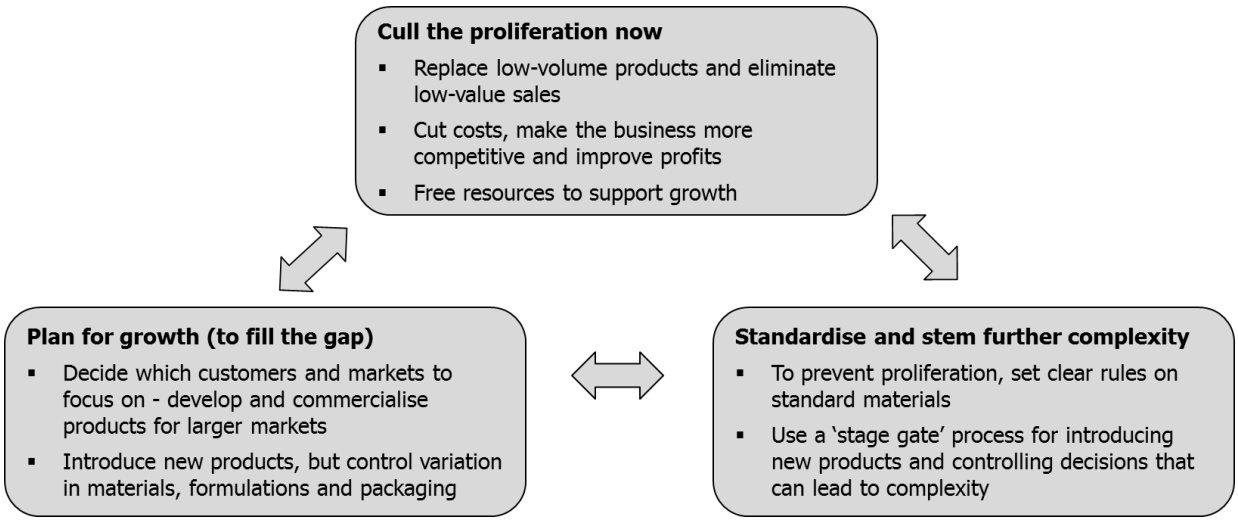
More management would be needed to eliminate the cost

A cull can permit a step-change reduction in complexity. But alone, it will not have the long-term impact desired unless the business can stop similar products creeping back in. The cull, which specifies what to stop doing, needs to be carried out in conjunction with:

- The introduction of controls to stem complexity at source – using a set of criteria and clear 'gates' to stem proliferation by controlling those decisions that can introduce complexity during new product development (NPD) and quoting.
- A plan for growth – which should specify what to do more of and define the segments to expand, new products, enhancements to service, investment needed, et cetera.

One concern that is likely to surface is the pace of the cull and its impact on revenue. Shareholders may demand that revenue be maintained, so a dramatic cull might not be acceptable. If so, a smaller and phased cull (in line with growth elsewhere) together with a tighter focus on new and standardised products, might be the preferred approach.

Chart 8: The steps to good complexity management

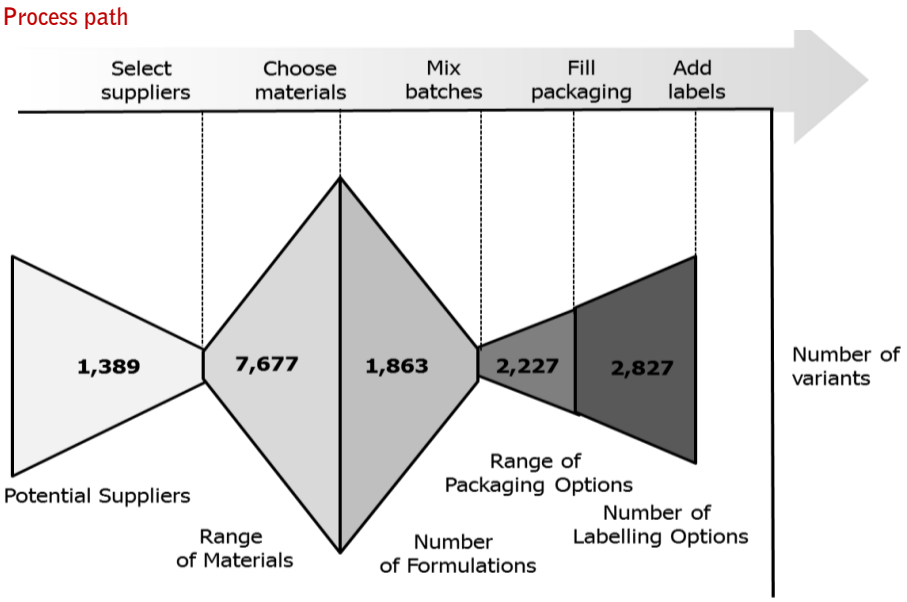


Culling products is usually an unpopular exercise. Commercial and Operations have to collaborate so the right answer is reached, sufficient costs are reduced and complexity is contained. In our experience, getting the Commercial function to lead the activity is a must!

8 Minimising costs in consumer goods

Collinson Grant recently helped a large consumer goods manufacturer to save millions of pounds at its UK factories by carefully streamlining the portfolio of products and the range of materials that go into them. With decreasing profitability, rising costs, and increasingly aggressive competitors, the Senior Team had identified the proliferation of products as a cause for concern.

Chart 9: The product variety funnel at a consumer products manufacturer



Although materials appeared to be the biggest driver of variation, because the mixing operation is done in batches, this did not add significant complexity per se. Investigations showed that the main culprit was further down the process during the filling operation where a wide variety of formats was having a crippling effect online efficiencies.

Once all the complexity and costs in operations were understood, our analysis found that the bottom 50% of products accounted for just 4.4% of gross profit.

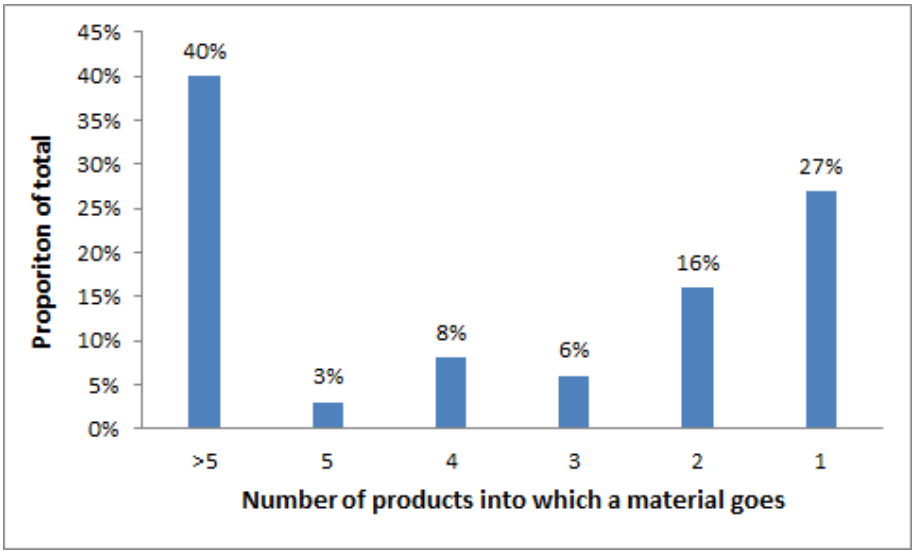
We worked with the Commercial teams to select those products that it would be acceptable to cull and by standardising packaging and materials in the remaining range, opportunities for huge savings were created. We then did the same for the group's businesses in Europe.

9 Simplifying the manufacture of food

A leading chocolate manufacturer faced high levels of promotional activity, with constantly changing packaging, based on retailers' preferences and on the latest media events. However, significant gains were still to be found from standardising packaging characteristics and defining a core range of materials – enabling volume discounts and better line efficiencies.

The starting point was to analyse three months' purchasing data, to pinpoint the number of products into which each material went, and to assess packaging designs and how they run down the packing lines. A series of hypotheses were developed which were then tested, adapted and validated with the Commercial, Development and Operational teams. At first glance (Chart 10), we saw that 27% of the materials were unique to just one product so there were plenty of opportunities to explore.

Chart 10: Number of products into which a material goes



Continuously designing new products and introducing variants of existing products was essential to maintain and promote the brand. But some of the principles of design for manufacture were still able to be deployed. And, although packaging is still the main driver of complexity for this confectionary manufacturer, it no longer suffers because of it. The 'brother and sister concept' was used successfully so the same settings on the line could be retained and efficiencies improved. And some materials – such as foils, inserts, films and labels – could be standardised across large parts of the range.

10 Streamlining the supply chain for clothing

With ever shortening product lifecycles, wide variety and high volatility of demand, the fashion industry is one of the most challenging. With thousands of new SKUs coming out every year, this fashion house brings new designs to the market every few weeks, and consequently had to design an entire manufacturing and supply chain with responsiveness at its core.

Informed decisions were made about structuring the manufacturing and supply chain organisation and processes:

- Postponing variation and using scale where possible – By delaying the addition of most variation until late in the process (during sewing and finishing) the business was able to buy materials and components in larger volume.
- Manufacturing to meet the latest trends and get garments to market quickly – By relying on front-line employees to provide feedback on market trends they were observing (styles, cuts, colours et cetera), and by changing the layout and organisation of the factory to cope better with a mix of both large and small orders, the company was able to respond quickly to minimise stock-outs, obsolescence and inventory.
- Outsourcing selectively but under close control – By concentrating most of its outsourcers close to the main site of manufacture in mainland Europe, a clear choice had been made to have a responsive supply chain over a more efficient one. The added costs, compared to a Far East outsourcer, were offset by the close control (on design and quality) exercised over the outsourcing partners and the reduced lead-times.

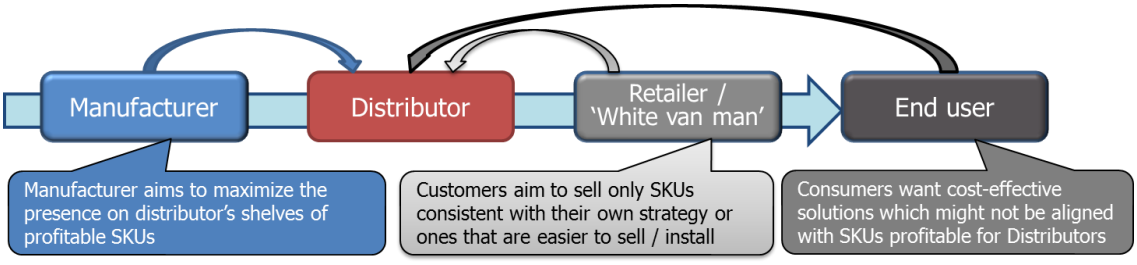
Having a responsive supply chain in the fashion industry – particularly for higher value items – is a must. The proliferation of products has not brought the supply chain of this business to its knees because of the way the processes and operations are designed and organised to cope.

11 Maximising profits in the distribution of electronics

We were asked to support a distributor of security products in the UK, Europe and South Africa.

A distributor can find itself being squeezed from either side in the supply chain. As products and markets mature, margins contract and the demands for choice grow; this can be a perilous position in which to sit.

Chart 11: The distributor conundrum



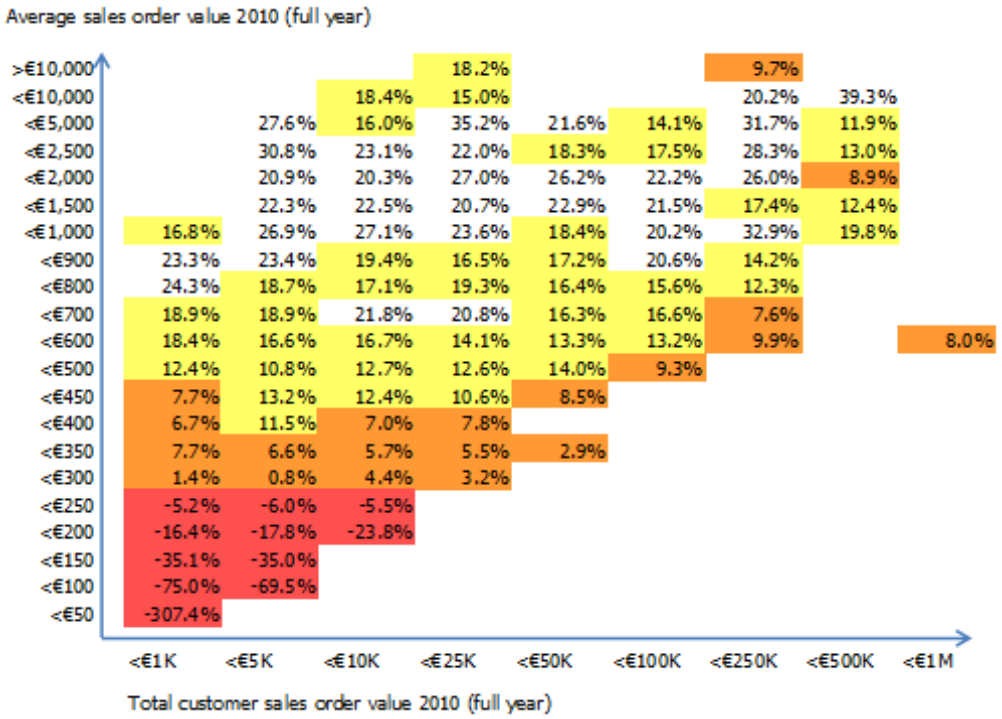
A distributor must decide:

- What service to provide and how to price it – What was demanded yesterday might no longer be relevant in adverse economic conditions with customers potentially willing to compromise on service in exchange for lower prices.
- Which customers to chase – Although growth in revenue is important, retaining margins is vital. Choices must be based on both value and the cost-to-serve (order size, frequency of orders, commercial terms and conditions, et cetera).

- Which products to select and push – Carrying the full range of products for all manufacturers is not cost-efficient (referencing, inventory, maintenance and obsolescence). The organisation should select those products that maximise margin and match their chosen strategy.

We classified customers according to their annual order value and we worked out the true cost-to-serve (Chart 12), allowing managers to understand where profits were really being made.

Chart 12: Margins after applying the true cost-to-serve



The potential to restructure the client base and product portfolio was then modelled with confidence. The senior team chose to rationalise their operations to reflect changing trends in technology and customers by:

- Differentiating service according to the true value of a given customer – Not all customers had the same value to their business. Understanding precisely the amount of effort that was being put into each one and factoring in fully all costs against transactions, allowed this distributor to develop a clear picture of real profitability per account and to discriminate service or charges accordingly.

- Defining the product portfolio available to each customer and varying lead-times – Some of this distributor's product range and availability was imposed by contractual requirements with large customers. But limiting the range of products in stock and their relative availability for certain other customers allowed for a rationalisation of its offering and reduced the cost of inventory.

- Aggressively phasing products in or out to minimise obsolescence – With constant pressure from manufacturers and customers to hold specific references in inventory, the organisation was often left with slow-moving products which then had to be heavily discounted. By defining precise rules and accountabilities on product introduction and phasing out, the organisation was able to significantly reduce the amount of write-offs and inventory.

- Cutting costs to improve margins – Thanks to the understanding on costs and complexity, the management team were able to make informed decisions on where savings could be made without damaging the business. In our experience, an efficient

organisation has 75% of the cost of its staff associated with 'core' activities which meet customers' requirements. This business is now very close to achieving that.

12 Making it happen in your business

The evolution of consumers and customers is bound to increase the variety of demands imposed on your operations. And, if anything, complexity is likely to increase as you expand. Some of the costs of complexity will be obvious (in production, and in material and supplier proliferation). But some are insidious and cause other inefficiencies which prevent your organisation from performing to its fullest.

Understanding where and why complexity arises and at what cost is your first step. But even then it might well be impossible just to reduce obvious drivers of complexity simply by cutting the number of SKUs. In any case, you should also revisit your products and processes, and reconsider the service you are providing. Adjusting the supply chain to cope better with the demands of variety and complexity might also be sensible.

However efficient your business, there will still be ways to minimise, adapt to, accommodate and control the effects of complexity. But, from time to time, you may find it necessary to tackle complexity head-on and remove it quickly – particularly when profitability is suffering and competition is tough. Only by understanding the drivers of complexity and cost can you do this successfully.

The successful organisations will be those that show they are capable not only of mustering existing capabilities, but also of transforming themselves along the way. To achieve such change you will require experienced managers and adequate support to help navigate through uncertain times.

13 Introducing Collinson Grant

Collinson Grant knows how to help restructure and refocus operations, redesign organisations and processes, improve performance, boost the effectiveness of supply chains, and manage complexity.

We help large organisations all over Europe and in the United States to achieve better operational results – supporting senior managers on projects to transform performance, strengthen competitiveness, increase profits and manage change with the minimum of disruption. We build long-term relationships, and have worked for several clients for more than thirty years

We have deep managerial and sectoral knowledge as well as wide experience. We recognise the problems and opportunities faced by managers in large international businesses. We bring a fresh approach to old problems and we know how to design projects and programmes to achieve the desired outcomes. And how to make the changes stick! We emphasise results and value-for-money. We expect to give a substantial return on the investment in us. So we do not recommend action unless the outcome will be worth it.

Forecasts and recommendations in a proposal, report or letter are made in good faith and on the basis of the information before us at the time. Results depend on the effective co-operation of the client and the client's staff. Therefore, no statement in a proposal, report or letter is a representation, undertaking, warranty or contractual condition. This Company shall not be liable for any losses which were not reasonably foreseeable on acceptance of a proposal or for indirect or consequential losses including loss of revenue, expected profits and claims by third parties.

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