The Twittering of Geese

A Management Storybook:

Products survive, markets evolve and firms grow

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Introduction

This is a story about a family of geese as they twitter around the geography of the farmyard in which they are housed and around the neighbouring fields. Father Goose, Gander, has a job to do protecting the little Goslings as they search and eat the birdseed scattered across the fields. Mother Goose will lay her eggs and play with the Goslings as they wander far and wide across the fields. But as time passes, they do wander across the fields, attacked by foxes and chased by different farmers

If this family of geese appear somewhat different it is thanks to the rules laid down by Gander. So how did it all begin? Gander decided to lay down a few rules of behaviour for the Goslings in terms of what to do and what not to do. Principally the Goslings have to know what field they should be in during the day and to be in a position to anticipate likely events..

Rule Number 1: Behaviour is quasi-hyperbolic
Intuition: Events in future time periods (t+1) are discounted by the events of today at time period t.

Gander: Good morning Goslings, Mother Goose has just informed me this morning that you are still wandering too far from home, hopping across the fields in search of birdseed. It can be dangerous - remember the fox and the farmer next door are always on the look out for intruders.

Gosling One: We know about the fox and the farmer next door, we take precautions and we are always very careful.

Rule Number 2: √This = That
Intuition: No matter what the reality is, it is actually always less than you think.

Gander: I'm afraid that it may not be enough. We are all housed on this farm and we really should not be eating the birdseed of the farmer next door. He may claim you all as his own property, his flock of geese and then fatten you up and sell you in the market.

Gosling Two: No, no he can't do that – we are housed in this farm and Mother always lays her eggs in this farm.

Gander: I'm afraid it is not as simple as that: we are housed every night on this farm and the farmer is offering us protection from the fox. Sure Mother Goose lays her eggs but the farmer next door might just pluck your feathers if you continue to eat his birdseed.

Gosling One: So are we fenced in?

Rule Number 3: Movement out of the field should be guided by the circulating circumference of the centre circled, a magic number $= c^4$

Intuition: Once you can map out your territory as a circle then movement is guided by the circumference of that circle.

Gander: Not exactly. I want to discuss with you this morning the meaning of wandering afar into different fields, what the farmer calls ‘real competition’, And I am going to discuss it in terms of understanding a very simple premise: action leads to reaction that requires a reply.

Mother Goose: Yes indeed, but before you do that I would place the word ‘real’ in parenthesis because of the difficulty of specifying the nature of the ‘reality’ in question Each of the Goslings will have to invest time and energy in understanding the fields and the physical side of competition, they will have different experiences and declare personal bonds. From the fox’s perspective each of us are prey.

Gosling One: Not again. We covered this last week. We know about the fox so we take precautions when we wander in the fields. If the fox is nearby we move together, make a hissing noise and wander back slowly to the farm.

Rule Number 4: Maximise the share of the fields under your control
Intuition: If you want to grow up to become geese like myself and Mother Goose then you must forage in the fields and take control of the birdseed.

Gander: But the fox is still cunning and he is winning. The action to which I refer is your individual decision independent of each other. It is a decision that requires each of you to anticipate a likely reaction from the fox as a competitor. This morning I want to emphasise that as a family your decisions are interdependent. But do each of you trust the other to do the right thing when a fox appears?

Rule Number 5: Avoid enemies while foraging for food.
Intuition: Competition can also be about making friends and promoting mutual understanding and friendship. The question ‘who is my enemy’, assuming it is helpful to you, is not going to be at all easy to answer. So avoid it.

Gosling Three: Depends on what the right thing is, I suppose! We are all afraid of the fox and instinctively I have always known to move together, hiss and move back to the farm. I observe all the Goslings doing it, so I do it. Whichever one of us moves first, then we all follow.

Gander: What if nobody moves?

Gosling Three: Hasn’t happened yet because we all individually know that if anyone of us moves first that the rest of us will follow in sequence until we arrive back safely on the farm.

Gander: Exactly: somebody has to move first otherwise we have no game – pardon the pun Goslings!

Rule Number 6: Stacking oranges always tumble.
Intuition: There is a group dynamic and if it can be achieved, everybody in the group will benefit.

Gosling Two: But what if I move first, but nobody follows me, then I am more exposed on my own and the fox will attack me.

Gosling Three: Yeah! I think we all think like that

Gander: As I said earlier, your decisions are interdependent..

Gosling Three: Indeed, and thus if we all think like Gosling Two nobody moves unless we move together. So this is what you mean by interdependence?

Gander: Yes: and if every detail and fact about each of you in the same, then we also have symmetry and this copper-fastens the outcome that no one Gosling will move independently of the others.

Rule Number 7: A follower is a leader guided by a mystical law of inversion.
Intuition: Some of us are sneaky followers, sitting on the circumference of the market and waiting until another makes a move outside the defined boundary.

Mother Goose: But Gander, surely they must think individually otherwise they may not grow up to become healthy feathered geese. They must know what to do if one of them decides to wander too far and comes face to face with a hungry fox.

Gander: Apologies, yes you are right too. Goslings, it is incumbent on each of you to remember to quantify your individual action in terms of a reply in case you wander too far away from the farm. We refer to this as your individual Nash reply. Once you decide to move away from the fox, the fox will react. But you should try to anticipate this reaction, making sure that your action is the best action given the reaction of the fox.

Gosling Two: The need for a reply becomes more acute with the presence of a fox as a near-rival in the product space as it is the near-rival that is the more likely to react to your initial action.

Gander: It may well be the case that the identity of the near-rival is unknown or if known the likely reaction is an unknown. This raises an important lesson to understand your market not just in terms of your consumers and customers but also in terms of your competitors as near-rivals.

Gosling Three: What market should we be in?

Gander: You should not be in a market where the identity of a near-rival is unknown or if known that the reaction is unknown. The answer requires existing research to be augmented by answering this question:

Table I

	ID of Near-rival	Likely Reaction
Known	Yes	No
Unknown	No	No

Gosling One: But the traditional management question is to focus on the market that we are currently in and on how to do better in that product market.

Gosling Two: Yes but applying the logic of Gander's argument, one could do better in existing markets by knowing the likely reaction and then formulating a reply, and to ensure that it is the best reply in terms of protecting any market share loss or EPS.

Mother Goose: Remember we refer to it as the Nash reply.

Gander: Gosling One do you recall an idea first championed by the late Edith Penrose in the 1950s wherein she referred to the possibility of managerial limits in decision-making within the firm?

Gosling One: Yes I do: Management at all levels are often frustrated in their ability to make the decision and while this may be due to management skills and training or the structure of the organization of the firm, there is also the possibility that there are a host of key drivers.

Gosling Two: As well, you mean?

Gosling One: Yes. Remember Father Goose referred to them collectively as the Penrose effect.

Gosling Three: As companies and firms become increasingly complex, management find that they are surrounded by information, they operate inside an information bubble and often the information is incorrect or misleading or flawed. Indeed management may not necessarily have the skills required to inflate the information bubble.

Gosling One: In other words, management is said to bounded-rational.

Gosling Two: And I suppose this is not helped by the increasing complexities of modern organizations that can give rise to x-inefficiencies in the organization.

Gander: Step back a bit little Goslings! Management take decisions but the decisions are those that minimize the opportunity cost of making that decision. Each decision is a binary choice: decide on X but not on Y.

Mother Goose: In other words, taking a decision on X that maximizes the return from that decision does not always translate ex-post. Therefore the decision on X must minimize the opportunity cost of not deciding on the alternate Y. Management are said to be risk-takers if they minimize the opportunity cost of the alternate.

Gander: Your mother is right. In helping them to do so, they need a trade-off relationship to copper-fasten the cost involved. Are profits to be invested in product X or Y? More acutely, the trade-off should be captured in terms of financial variables, for example, profits and market share, expenditure on R&D and dividends.

Rule 8: Know the identity of your nearest rival.
Intuition: You should not be in a market where you do not know the identity of a near rival nor the likely reactions of a near rival.

Gosling Two: What about the near-rival?

Gander: Indeed the trade-off will depend on the likely reaction from a near-rival; if management launch a new product, for example, its success or failure will have as much to do with the decision of a near-rival to re-brand or differentiate its product lines in reaction.

Table 2

Bounded rationality	Yes
Risk-averse	Yes
Trade-offs	Yes
PENROSE EFFECT	
X-inefficiency	Yes
Near-rival	Yes
No Nash reply	Yes

Mother Goose: We should look more carefully at the trade-offs and ascribe to management an indifference relationship that states that they are indifferent between two choices if the outcome as measured by some metric – usually market share – remains the same.

Gosling One: What do you mean? Can you draw it?

Mother Goose: Try it.

Gosling One: Can I scribble on the clay?

Mother Goose: Yes, go ahead.

Gosling One: So as they move along the indifference as illustrated the level of market share does not change but the opportunity cost does change. It is also important to think of the opportunity cost [$\Delta Y/\Delta X$] in terms of what you give up (ΔY) in order to receive (ΔX): higher indifference curves represent higher levels of market share.

Insert Figure 1

Gosling Two: What about the financials?

Gosling One: Look at this scribble. The financials are represented by the more concave function with a maximum point as represented in the illustration. This point, M, is achievable and indeed may be the only point of interest to management. It can correspond to the point of maximum profit or indeed a point of maximum market share.

Insert Figure 2

Gosling Three: What's wrong with that decision?

Gosling One: Absolutely nothing: it is often good business and has been for many companies. The move from A to M would be deemed as the balanced move with both profits and market share increasing as management move from A to M.

Gander: Ah! However management often believes that they can do better – they have a subjective belief structure or utility function as illustrated in Figure 1. Management believes that they can do better than the market (as defined by their competitors) and are prepared, as risk-averse management, to move to point E with shareholder approval or vote of confidence in the move.

Insert Figure 3

Gosling One: Shall I scribble again on the clay?

Gander: If you must.

Gosling One: Figure 3 illustrates an ultimate goal as illustrated with costs on the vertical axis, profits on the horizontal axis and market share represented by the map of indifference curves. The preferred move is from A to E. But there is the danger of stopping at M with a higher market share and a costs-profits squeeze.

Gosling Three: Tell me how you interpret point like M in terms of costs.

Gosling One: Think of it as costs increasing initially from A to M and decreasing after that point as economies of size and scale put downward pressure on costs. But I will come back to this issue later.

Mother Goose: The Penrose effect would be acute at this point as management struggle with the options: stay at M or move to E.

Gosling Four: Goose Three is right. What about the likely impact on production and costs?

Gander: Welcome to the debate Goose Four, thought you were disinterested?

Gosling Four: Not really, just searching for some grain.

Gander: So let's focus on a particular aspect of the production-cost relationship that may be of some help to management in resolving any cost issues at a point like M in Figure 3 earlier and as they move from M to E..

Gosling Four: But the focus must be on understanding productivity as a crucial key in unlocking some of the fundamental costs of producing a level of output [q].

Gosling Three: And there is the wage bill, the total variable cost [TVC] that increases as production runs increase: simply, the more you employ [L] the greater the wage bill [w] as an absolute.

Gosling Two: However, management also monitors the average variable cost [AVC] over the production range in order to control costs during production. Embedded in this monitoring should be a monitoring of the average productivity [AP] per worker.

$$TVC = w.L$$

$$AVC = \{w.L\}/q$$

$$AP = q/L$$

$$AVC = w/AP$$

Gander: Enough children. Enough please.

Mother Goose: Let your Father get on with it please.

Gosling Two: No. Just like management you are not interested in my little equation, are you?

Rule 9: Offer incentives to the most productive workers.

Intuition: To simply reduce the number employed by a voluntary scheme will create a scenario where the most productive exit, and thus costs will increase with declining productivity..

Gander: Convince us then.

Gosling Two: An hourly wage bill of £9 can be interpreted as follows: first employee receives £5 per hour, second employee receives £3 and the third employee receives £1. Alternatively, the same hourly wage bill can be normalized $\Sigma w = 1$: first employee receives $5/9^{th}$, second receives $3/9^{th}$, and the third receives $1/9^{th}$. This emphasizes the productivity of each employee: the first employee receives 5 times as much as the first employee *only* because the first employee is worth 5 times more in terms of productivity. In other to introduce a normalized wage or salaried structure, there must be incentives to progress coupled with a hiring-and-firing regime if performance is not matched to the normalized wage level.

Gosling Four: Yes. If costs are increasing then a contributory factor may simply be decreasing productivity as the costs and measure of productivity are inversely related:

$$AVC = \Sigma w / AP = 1/AP$$

Gosling One: Can I scribble?

Gosling Four: Try it Goose One. It will be difficult to capture the essence of the idea really. Maybe we should also look at the level of fixed costs.

Insert Figure 4

Gosling One: But surely fixed costs are fixed, so it is just a straight line running parallel to the x-axis.

Gosling Four: Hmm! But the average fixed cost [AFC] is ever decreasing over the production levels at the plant.

Gosling One: Like this scribble in Figure 5?

Gosling Four: That is it; and I see where you also vertically added up the AVC and the AFC curves to arrive at the overall average curve [AC].

Insert Figure 5

Gosling Two: Indeed.

Gosling Four: As I said before if costs are increasing then a contributory factor may simply be decreasing productivity.

Gosling Two: So this could manifest itself at shift level or at plant level. In order to keep productivity up, workers could be offered incentives through better work conditions, bonus schemes, equity options or by training, re-tooling or more frequent promotional opportunities within the company. A normalized wage structure should facilitate management in persuading the more productive to remain in the firm.

Gander: Sounds convincing, is it practical?

Gosling Two: Indeed it is. The particular type of firm with a normalized wage or salaried structure is the *s-firm*, the stakeholder firm wherein workers can choose to produce and are the participants of production not a production participant.

Gander: But do the workers have a say on the price of their productivity as the point of sale?

Gosling Two: I'd agree that more attention should be given to the level of price and the likely sensitivity of sales and quantity to the level of any price changes. There is the concept of elasticity in economics that determines the crucial link between price, elasticity and total revenue [TR].

Gander: Is it of much use to management?

Gosling Two: It is. This is captured by the TR test in Table 3:

Table 3

	Elastic $\varepsilon > 1$	Inelastic $\varepsilon < 1$
Price Increase	TR Decrease	TR Increase
Price Decrease	TR Increase	TR Decrease

Gander: Is it a new idea?

Gosling Two: Not really. The concept is applied in everyday pricing but hardly referred to as the TR test: business class fares $\varepsilon < 1$ are higher than economy fares $\varepsilon > 1$, weekend charges $\varepsilon > 1$ from utility companies are cheaper than peak daily charges, and branded goods $\varepsilon < 1$ tend to more expensive than generic brands $\varepsilon > 1$.

Gosling Four: But what determines the degree of elasticity for my product?

Gosling Two: Well, one determinant of elastic demand is the presence of a near-rival in the product market. Both products would be classified as substitutes but not necessarily each others substitute. The price of product A might increase and consumers switch to buy more of the substitute product B, but it does not necessarily follow that if price B increased that more of A would be purchased.

Gosling Three: So is it fair to say that it is incumbent on management to compute the cross-price elasticity of demand between A and B?

Gosling Two: Absolutely. But the level of price will also be an important determinant of elasticity. If management work from the premise that the random consumer on average will buy more if price falls then consumers can be described by a negatively sloped demand line as illustrated by Figure 6.

Insert Figure 6

Gosling One: Can I scribble on the clay?

Gosling Two: Sure, go ahead, you are becoming an expert in the scribbles.

Gosling One: There it is, but Figure 6 is important for another reason Goose Two – look at the slope of the line $\Delta p/\Delta q = 1$.

Gosling Two: Indeed you have drawn a linear demand and the elasticity formula collapses to p/q.1 Above the mid-point $p > q$ therefore $\varepsilon > 1$ and below the mid-point $p < q$ therefore $\varepsilon < 1$. The mid-point is where $\varepsilon = 1$.

Gander: That mid-point is crucial; it is the trigger price for a given demand between changing elasticities on that demand.

Gosling Two: Yes indeed. No price fall or rise should be more than the metric difference between the present level of price and the trigger price as illustrated by Figure 7.

Insert Figure 7

Mother Goose: What do you propose to call this metric difference?

Gosling Two: We hope to call it the Marlboro effect. It reinforces the point that price movements should be sequenced but sequenced to the level of the trigger price, then elasticity should be re-evaluated and the price sequencing would continue until the price level was reached.

Gander: Now can I return to my opening point about action, reaction and reply?

Mother Goose: The children agree, cackle on so.

Gander: In their discussions on competition, management begins from a premise of non-cooperative behavior. In meeting rooms it is the quintessence of aggressive competition in business.

Gosling Four: Yet something to be avoided if it incites an expensive price war.

Mother Goose: Don't interrupt your father.

Gander: Earlier this morning I referred to the likely reaction from a near-rival. This can be characterised as management's best guestimate of that reaction.

Gosling Four: What is a guestimate?

Gander: It is like this: if management guess that there is unlikely to be a reaction then we say that their conjectural variation [CV] is zero; however, if they anticipate a likely reaction then we say your CV is non-zero. Management should avoid a situation where they take a decision with CV = 0.

Gosling Four: Because?

Gander: Because in that scenario they would have no reply in the event that the near-rival does indeed follow the lead in the action.

Gosling Two: What a dilemma to be in?

Gander: Indeed, to be avoided. Management with CV is defined as players in a game of strategy. In this scenario a price war could easily erupt as both players misinterpret their respective price signals. This should be avoided.

Gosling Two: So are you saying that if one player wishes to protect market share then an option is to try to retard or delay entry.

Gander: Yes. It is risky because it glides in the face of competition legislation.

Gosling One: What legislation?

Gander: I'll come back to it later. One player opts to retard or delay entry. The player persists and calculates that the benefits (B) of frustrating the new player greatly outweigh the expected costs (C) of punishment for infringement of the competition law.

Gosling Three: How, by simply using price could the player hope to achieve that outcome?

Gander: One strategy is to limit price. This involves signaling a price that sets the entry function (E) to zero forcing the new player to abandon entry plans at this time. But the limit price is never an actual validated price but a signal that is interpreted by the new player as a credible threat post-entry.

Gosling Three: Credible in the sense that the player did threaten to limit price and then actually carried the threat through by reducing price post-entry?

Gander: That's it exactly.

Gosling Two: So price becomes a like signal carrying behavioral information across the competing players?

Gander: Yes. And it behooves management to read the signals correctly.

Gosling One: If not, is it like a Penrose effect?

Gander: Totally and costly.

Gosling Four: There is an alternative: Surely, the new player could adopt a poker strategy and call-the-bluff of the first player, proceed to enter the market by shading price, forcing the first player to match the lower shaded price.

Table 4

	Avoid Price War	Price War
Avoid Price War	(4,4)	(3,0)
Price War	(0,3)	(-1,-1)

Gander. Yes. But the outcome would be a price war. Remember the players are further constrained by the zero-sum assumption.

Mother Goose: You need to explain that to them.

Gander: If Goose One eats all the grain then there is no grain left over for the rest of us or if Goose One and Two increase their consumption there will be less grain for the rest of us. Their gain is my loss and with a fixed amount of grain the sum is zero.

Gosling Three: So if one player gains 0.5% market share should it be interpreted as a loss of 0.5% to other players in the same market?

Gander: Yes, that is the zero-sum. And even if the market is growing one player's gain should be looked at as another player's loss.

Gosling Three: And in a market described by the zero-sum, is a price war more or less likely?

Gander: More likely if the price signals are misinterpreted. Look at the payoff matrix in Table 4. The preferred outcome is (4,4) which is a win-win outcome for both players. They will come to this realization after a period of time. It is because of their close interdependence in a product market, where number of players is less than 5, that the zero-sum assumption becomes more acute in punishing that player who misreads the price signal of a rival.

Mother Goose: But remember in the same market wherein the win-win outcome is to avoid a price war, prices will fall, maybe even fall in sequence to a trigger price and there will be a choice of price on offer to discriminating consumers but.

Gander: I think we need to address the issue of the competition legislation.

Mother Goose: Indeed. We have to address the concern that a win-win outcome for the players is bordering on some degree of implicit collusion on price.

Gander: For that to be the case, Mother, there would have to be some coordinated pricing between the two players. But this is a matter of interpretation of how market prices evolve in a typical product market.

Gosling Two: How do prices evolve?

Gander: Price movements between rival players are positively correlated as illustrated by Figure 8: moving from A to B is the essence of competition but it could also reflect a matching of prices by rivals in a leader-follower game. Similarly, moving from B to A could be interpreted as collusion or as an accidental sameness in price [ASP].

Insert Figure 8

Gosling Two: But isn't that how a judge in a Court of Law might read it?

Gander: It depends.

Mother Goose: You need to cackle some more Father.

Gander: Here it is. Too much emphasis on price movements obfuscates the central issue of market price, that is, the price charged by all or most players and the price that can be validated by the majority of consumers.

Gosling Three: How can consumers validate a price?

Gander: Simply. They can purchase the product at the stipulated price at a point of sale.

Gosling One: So long as the prices are validated you mean the consumer actually wins, and if the prices are sustainable over time then the pricing regime is fair or legal?

Gander: Why complicate matters? Simply, if a rival offers lower prices to capture some additional business then it is natural for a rival to match the price to either protect existing customers or to win new customers in competition with the other rivals in the product market. Conversely, if a rival increases price, the management remember may have a CV = 0 if they are confident that they can sufficiently price differentiate their product from the near-rival's product in the market.

Gosling One: But what if the price increase is predicated on $CV \neq 0$?

Gander: Then that demonstrates to a judge, for example, that there is history in the market that persuades management of the view that near-rivals will follow their actions.

Mother Goose: What your Father is trying to say is that they have done so before and will do so again unless management is able to sufficiently price differentiate their product in the market.

Gander. Yes, thank you Mother Goose. The inabilities by management to price differentiate to that degree to dissuade the near-rival from following the price increase is the kernel of the ASP standard. What looks like price collusion in the movement from B to A in Figure 8 is *de facto* evidence of price differentiation constraints arising from the exigencies of market demand.

Gosling Two: So the player cannot capture additional market share or retain its market share because at the relatively higher price the consumers are switching to the near-rival's product.

Gander: Yes, and since the demand is inelastic, consumers value the good at the relatively higher price, the near-rival follows with a not dissimilar price increase. Consumers are sovereign in their choice and provided there is choice they can always purchase at a relatively lower price.

Gosling Two: But isn't there some issue with low prices too?

Gander: You mean predatory pricing. Yes it could arise as prices move from A to B but consumers are unlikely to complain about lower prices.

Gosling Three: Who would complain?

Gander: A near-rival more likely, who might argue that you are trying to squeeze the near-rival out of the market.

Mother Goose: But I had thought the appropriate standard is the protection of competition not the protection of rival competitors.

Gander: That is so: but a judge would have to be convinced that the low price was not deliberately intentional to drive the near-rival out of the market with a view to increase price back up again on exit.

Mother Goose: Hmm, cackle, cackle!!

Gander: In other words, a plaintiff would have to show that the defendant could recoup any losses sustained by the lower price. Also, judges may adopt a common law standard

of reasonable price and argue on the balance of probabilities that the price was not unreasonably low.

Gosling One: Competition is complex.

Gosling Two: Real competition is not complex.

Gosling Three: What do you mean?

Gosling Two: Real competition on prices is simply about offering relatively lower prices to consumers than your near-rival, and provided the lower prices can be sustained in the market due to economic efficiencies both consumers and near-rivals win. Efficient firms drive real competition.

Gosling Three: So inefficient firms exist?

Gosling Two: Inefficient firms curtail competition in a market, preventing the market evolving competitively, relying on old technologies, lagging innovation and protecting markets.

Gosling Three: There is no room for inefficiencies, you mean?

Gosling Two: There is no room in real competitive market for firms with inefficient production. There may well be inefficiencies in a representative firm that are not due to production *per se* but they should self-correct with global competition.
:
Mother Goose: If there are efficient dominant firms in a market, then allow firms of at least the same degree of inefficiency to co-exist, otherwise the market values will fall. We can't all be fenced in on one farm, we need to wander and exploit the farmyard-wide economies of scale.

Gander: Absolutely: I agree. Real competition is also about understanding action, reaction and reply. In taking a decision, management should stop and evaluate the likely reaction from a near-rival. We should remember that Goslings: what is sauce for the goose is sauce for the gander!

Gosling One: The farmer will always want to pluck the goose with most feathers anyway so real competition amongst the farmers will occur as we continue to wander far away from the farm, eating birdseed in another farm, and possibly laying our eggs in a third farm.

Gosling Three? Who gets the plumage then?

Mother Goose: Leave that for another day. Ok the day is over, good night little Goslings, and to help you find an answer, please review the following lessons from today.

What do you maximize?
Action leads to reaction requiring a reply – this is the meaning of strategy.
Lowest costs sustainable at max AP
Know your near-rival.

Scramble, contest or combat – observe the system.
Avoid price wars.
Products must have global reach
Products survive, markets evolve and firms grow.