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CHAPTER 2
COMPETITIVENESS, STRATEGIC PLANNING, AND PRODUCTIVITY

Teaching Notes

Most of the students already know some of the concepts in this chapter (from other courses or general business knowledge): (a) the competitive attributes of goods and services such as price, quality, and timeliness, (b) plans and strategies, and (c) productivity.

The three apparently disjointed topics can be related through the following argument: companies must be productive in order to be competitive, and to be competitive they must have goals and some well-thought-out plans or strategies to achieve them.

Concepts new to students will be (a) value or best buy, order qualifies and order winners (b) operations strategy and (c) measuring productivity.

Answers to Discussion and Review Questions

1. The four key purchasing criteria are price, quality, variety, and timeliness. Every purchase is different. For example, one may buy a very inexpensive Durabrand electric bread knife, but more expensive and better quality (according to consumer ratings) Hamilton Beach mixer. Some consumers look for special colours and models, and are willing to pay more for them. Everyone prefers to have the items they need available without delay, but some will wait a little in order to get a better price. For example, books are cheaper if purchased directly from Amazon.ca, but one has to wait 1-2 weeks.

2. Organizations compete with cost, quality, flexibility, and delivery. WestJet competes based on cost. Cadillac competes based on quality. Dell competes based on flexibility (customization). Dominos Pizza competes based on delivery (within 30 minutes or free).

3. Characteristics such as price, quality, and timeliness can be order qualifiers or order winners. Order qualifiers are the minimum level of characteristics required to be considered as a qualified supplier. Order winners are those purchasing criteria that cause the selling organization to be perceived as better than the competition. For example, for auto manufacturers operating just-in-time, on-time delivery and quality of parts of a supplier are order qualifies and cost is order winner.

4. Competitive advantage can be developed over time by focusing on a limited range of goods or services, and/or on a technology. Using teamwork and rewards, an organization can develop its capabilities (also called core competencies). Companies should use past experience and expertise in design, operations/manufacturing, or marketing, and leverage them to introduce new goods and services

5. Strategic planning is the managerial process that determines a strategy for the organization and implements it through allocation of resources and action plans. Without a goal and a strategy, the organization is aimless and cannot compete.

6. Briefly, strategic planning starts with top management soliciting the performance of current strategy from department managers, and commissioning a market research study of the industry

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and where it is headed in the next one to five years. Then, the management team may form/adjust the goals, and brainstorm and evaluate alternative ways (strategies) to achieve them. Finally, the chosen strategy is implemented by determining a set of action plans at the operating department level.

7. An operations strategy comprises a set of well-coordinated policies, objectives, and action plans for the operations function..

8. The nine strategic decision categories are: Facility, capacity, vertical integration/outsourcing, supplier relationship/partnership, product mix and new products, process types & technology, human resources, quality, and operations infrastructure and systems.

9. The formulation of an operations strategy involves the following steps: (a) determine the operations requirements of the business strategy, (b) categorize customers and their competitive priorities, (c) group product lines into types, (d) assess the strengths & weaknesses of the current operations strategy and products, (e) assess the degree of focus in each plant, and (f) Determine the objectives, policies, and action programs in the nine strategic decision categories for product lines and assign them to plants.

10. Answers vary for each student.
Example of a policy for waiting staff: Respond to every customer request with "my pleasure".
Example of an action plan: hire a design artist, buy a camera and plate making machine (in order to reduce graphics production lead time from 10 days to 1 day)

11. A time-based strategy focuses on reducing the time needed to conduct the various activities in product design, production, and distribution. Examples include just-in-time ("made for you") production by McDonald's and cellular layout by StandardAero.

12. Answers might vary for each student. Boeing was forecasting that demand for medium-to-long range flights between medium-size cities will increase, whereas Airbus was forecasting that demand for very long-range flights between major cities in Asia and North America, will increase. For more info. see e.g., http://www.smarttravelasia.com/AirbusVsBoeing.htm.

13. Productivity is a measure of productive use of resources, usually expressed as the ratio of output to input. Productivity is important because it is related to profitability and standard of living.

14. Factors affecting productivity: method and management, equipment and technology, and labour. An example of a method and management improving productivity is JIT (lean) production. An example of an equipment and technology improving productivity are computers and Internet. An example of labour improving productivity are trained and knowledgeable workers.

15. The Japanese automakers such as Toyota and Honda are using more productive work methods, such as lean production, than the Big 3 North American automakers (GM, Ford, Chrysler). Also, they have better relations with their suppliers and workers.

16. Answers might vary for each student. "If productivity increases, fewer workers will be needed" is not necessarily true. For example, output can increase or other types of products can be introduced. Even when number of workers is reduced, the displaced workers can move to other industries such as services.

17. Efficiency is a narrower concept that means getting the most out of a *fixed* set of resources. Productivity is a broader concept that means better use of overall resources. For example, an

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efficiency perspective on mowing a lawn if given a hand mower would focus on the best way to use the hand mower; a productivity perspective would include the possibility of using a power mower.

18. The main reason that productivity measurement in health care is difficult is that measuring output is difficult because it is partly intangible, involves intellectual activities, or the output has a high degree of variability. One measure of output is quality-adjusted life years or life expectancy after a patient has been diagnosed for a disease and then is treated or operated on. For example, consider diabetes. Life expectancy depends on how early the patient goes to his/her doctor and on performing some of the treatment personally (e.g., injecting insulin). If diagnosis is not done early enough or is not managed well, diabetes can become serious and lead to other serious health problems. In this case, the extent of deterioration in health due to diabetes may be hard to measure. The involvement of patient and deterioration in health due to diabetes makes measuring the productivity in diabetes healthcare difficult.

19. IKEA targets young furniture buyers who want style at low price.

20. Answers vary. Amazon guarantees that the customer receives what was advertised on its web site by third party sellers. An example is when a fridge coil brush was advertised as a set of 6 but only one unit was received by the customer. The seller refunded the customer without asking that the brush be returned.

21. Price (including free shipping)
Quality in the form of customer service (website easy to use, flexible return policy, pickup or return at store, toll free live customer service person).

22. Nova Scotia Power combined the jobs of a meter reader, a meter installer (to replace broken meters), and a bill collector (who could disconnect service because of overdue account). The new job was called customer-service field representative (CSFR).

Answers to Taking Stock Questions

1. Top and senior management should be involved in formulating organizational strategy. However, the opinions of middle and lower management people should also be sought.

2. Answers vary for each student. Competitive trade-offs that may arise in a fast-food restaurant include:
   - product variety vs. speed of service: too many products will reduce the production speed
   - cost (staff wages) vs. speed of service: too few staff will increase wait times

3. a. Technology improves competitiveness by
      - reducing product cost/price (due to more efficient/automated processing)
      - increasing quality (e.g., automated quality control)
      - enabling faster delivery (e.g., faster order processing, better communication, easier coordination of supply chain, automatic billing; due to EDI and an ERP software)
      - enabling better decisions (e.g., using MIS, analytics, GIS)

   b. Technology improves productivity due to most of the reasons in part a, especially by making production of goods and services more efficient (reducing costs, increasing speed). This involves using machines and computers in production of goods and services.

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4. Make ethics part of values and culture of the organization. Be an ethical organization. Obey the law and spirit of the law. Articulate ethical values in the strategy. Emphasize principles, rather than rules. Emphasize individual ethical behavior. Encourage employees to challenge ethical issues. Have a process to resolve ethical issues. Make ethics training part of employee training. Be transparent to stakeholders. For more detail, see http://www.scu.edu/ethics/practicing/focusareas/business/strategic-plan.html.

Answer to Critical Thinking Exercise

The automated processing would give a much higher labor productivity ratio than the manual processing because it requires less workers. Use multi-factor productivity for a more meaningful measure.

Answers to Experiential Learning Exercises

1. Answers vary. You can use Loblaw case at the end of chapter. Purchasing criteria used by consumers include price, quality, variety, and timeliness, and competitive priorities used by stores include cost, quality, flexibility, and delivery. For example, Loblaw (Superstore) offers low prices, Sobeys emphasizes quality (including customer service), Canadian Tire has low variety but a deep assortment of automotive parts and supplies, and Walmart offers timeliness (high availability) as well as low price and high variety.

2. A goal should be something major and would take a year or more to be accomplished. Answers vary. For example, "my goal is to graduate with a good GPA". The strategy in this case could be "don't get a full-time job, but get family support; don't party too much, but study hard".

3. Answers vary. It may be easier to answer this question if a company with published annual reports (e.g., Canadian Pacific, Loblaw, WestJet, McDonald's) is used. For example, a goal of McDonald's is "Made for You" or assemble-to-order while still achieving the 90 second service delivery standard. The strategy used was just-in-time system (see McDonald's "Made for you" video).

Answers to Internet Exercises

1. Answers vary. For example for Canadian Pacific Railway (CPR), the most recent annual report that contains relevant information is http://www.cpr.ca/en/invest-in-cp/financial-reports/FinancialReports/Attachments/200/cp-ar-2011.pdf. Page 3 under "Strategy", Our **vision** is to become the safest and most fluid railway in North America.
   Our **objective** is to create long-term value for our customers, shareholders and employees by disciplined execution of our **Integrated Operating Plan** ("IOP"); by executing on our Multi-Year Plan which enhances and supports our IOP; and by aligning all parts of the organization around our five **core beliefs**:
   - **Service:** Reliable and consistent service is our product. We are committed to executing our IOP in order to meet and exceed the needs of our customers in a cost-effective manner.
   - **Safety:** There is no job at CPR that is so important that we can't take the time to do it safely. Our comprehensive safety framework safeguards our employees, the communities we operate through, the environment and our customers' freight enabling us to provide an effective transportation solution.
   - **Productivity and Efficiency:** Based on a culture of continuous improvement and accountability, we are always looking for better, less costly, more reliable ways to operate our business.

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- **People:** We pride ourselves in our well trained and knowledgeable team of railroaders. We are committed to executing the IOP and collaboratively working with our customers.
- **Growth:** We invest in our franchise to enhance productivity and service, which allows us to capitalize on growth opportunities with new and existing customers at low incremental cost.

CPR doesn't have a Mission statement.
CPR's vision on p. 3 of 2011 Annual Report is to become the safest and quickest railway in North America.
Markets are described separately on p. 4: (a) bulk material to Asia, e.g., for Teck, Canpotex, grains), energy (Bakken, Oil Sands, etc.), and others (intermodal, automobiles, forest products).

CPR's objective (long-term goal) is creation of long-term value by execution of its Integrated Operating Plan (strategy). Components of the strategy (called core beliefs), expanded from p. 4, are

(a) reliable cost-effective service (scheduled, rightly-located assets, network optimization, fast switching)
(b) safety (workers, communities)
(c) productivity (C.I., long trains, fuel efficiency, consolidating locomotive repair facilities)
(d) people (trained, involved, and measured workers)
(e) capital investment (lines, terminals, locomotives, IT)

2. Flexibility (custom made-to-order and JIT) bags.

3. a. McDonald's competitive priority is delivery speed (quick service).
b.

Goal	Strategy & Actions
Order-to-delivery time = 90 sec	JIT (made for you)
	Universal holding cabinets, Fast (11 sec) toaster Kitchen video system, Software for forecasting

4. a. Jiffy Lube and other fast oil-change services were created in the 1980s to fill the gap left by closure of full-service gas stations (with service bays).
b. Jiffy Lube's competitive priority is delivery speed (fast service), without appointment.

5. a. Canada Post is in financial trouble because the number of letter mail has been decreasing due to e-mail and texting. This has reduced its revenues. Also, its operating cost is high due to public policy obligation to service rural and northern communities.
b. Yes, cost. It has to be cheaper than a courier such as FedEx.
c.
   - No more door-to-door deliveries. Instead, people pick up their mail/package from a community mailbox.
   - Instead of standalone new post offices, postal service will be offered by franchises (i.e., stores such as Shoppers Drug Mart).
   - Faster sorting machines and consolidation of sorting facilities

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- Workforce will be reduced through attribution and burden of pension plan will be reduced.

Solutions to Problems

1. $\frac{300 \text{ SBC}}{7 \text{ Workers}} = 42.857 \text{ SBC/Worker last week}$

$\frac{240 \text{ SBC}}{5 \text{ Workers}} = 48 \text{ SBC/Worker this week}$

Productivity was higher this week.

2.

Week	Crew Size	Square Metres Installed	Labour Productivity m^2/person
1	4	960	240
2	3	702	234
3	4	968	242
4	2	500	250
5	3	696	232
6	2	500	250

Even-sized crews are more productive than odd size crews, and a crew of 2 has the highest productivity.

3.

(1) Week	(2) Units Output	(3) =(2)*$140 Sales	(4) kg Material	(5) =(4)*$6 Material	(6) Workers	(7) =(6)*480 Labour	(8) =(7)*1.5 Overhead	(9) Total Cost	(10) MFP (3) ÷ (9)
1	300	$42,000	45	$270	6	$2,880	$4,320	$7,470	5.62
2	338	$47,320	46	$276	7	$3,360	$5,040	$8,676	5.45
3	322	$45,080	46	$276	7	$3,360	$5,040	$8,676	5.20
4	354	$49,560	48	$288	8	$3,840	$5,760	$9,888	5.01

Multifactor productivity is dropping steadily from a high of 5.62 to a low of 5.01 ($ output per $ input).

4. a. Before: 80 ÷ 4 = 20 carts per worker per hour.
   After: 84 ÷ 3 = 28 carts per worker per hour.

   b. Before: Costs $10 × 4 = $40 + $40 = $80; hence MFP = 80 ÷ $80 = 1 cart/$1 Cost
   After: $10 × 3 = $30 + $50 = $80; hence 84 ÷ $80 = 1.05 carts/$1 Cost

   c. Labour productivity increased by [(28-20)/20] = 0.4 or 40%
   Multifactor productivity increased by [(1.05-1)/1] = 0.05 or 5%
   Multifactor productivity is more appropriate because of change in machines and their cost.

5. Without scrap, the output can be 91.1 units per hour

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$$\frac{82}{1-.10} = 91.1$$

The increase in productivity would be 91.1 - 82 = 9.1 units per hour.
This would amount to an increase of (9.1 / 82) = 0.111 or 11.1%.

6. Current week's labour productivity = $\frac{160 \text{ units}}{40 \text{ hrs.}} = 4 \text{ units / hr.}$

Previous week's labour productivity = $\frac{138 \, units}{36 \, hrs.} = 3.83 \, units / hr.$

$$Productivity\ Growth = \frac{Current\ Week's\ Productivity - Previous\ Week's\ Productivity}{Previous\ Week's\ Productivity}$$

$$Productivity\ Growth = \frac{(4 \ units / hr.) - (3.83 \ units / hr.)}{3.83 \ units / hr.} = +.043$$

Thus, there was an increase of 4.3% in labour productivity.

7. Let N = no. of workers per shift

Before

Labour productivity = 300 backplanes / 3(7)N = 14.2857/N backplanes per worker per shift

After

Labour productivity = 500 backplanes / 2(5)N = 50/N backplanes per worker per shift
Growth in labour productivity = (50/N – 14.2857/N) / 14.2857N = 2.5 or 250%

8. a. Labour productivity
   Before: 7/3 = 2.3333 titles per worker per day.
   After: 12/3 = 4 titles per worker per day.
   Growth = (4 – 2.3333) / 2.3333 = .714 or 71.4%.

   b. Multifactor productivity
   Before: = 7 / ($480 + $300) = .008974 titles per $ cost.
   After: = 12 / ($480 + $600) = .011111 titles per $ cost.
   Growth = (.011111 - .008974) / .008974 = .238 or 23.8%.

   c. Multifactor productivity is more appropriate because growth is higher since the overhead costs have increased.

9. a. Before:
   Labour productivity = 1 / (20/60) = 3 coils per worker per hour.

   After:
   Labour productivity = 1 / (13/60) = 4.6154 coils per worker per hour.

   b. Growth = (4.6154 – 3) / 3 = .5385 or 53.85%.

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10. a. labour productivity:

(i) 300 / 5(1) = 60 m^2 per worker per day

(ii) 300 / 2(2) = 75 m^2 per worker per day

(iii) 300 / 1(1) = 300 m^2 per worker per day

b. Growth due to method improvement (from (i) to (ii)) = (75 - 60) / 60 = .25 or 25%

c. Growth due to technology (from (i) to (iii)) = (300 - 60) / 60 = 4.0 or 400%

11.

Cold Draw Dept.

	Labour	Output	Productivity	Prod. growth
Year	(1000 hr)	(1000 ft)		
0	228	18269	18269/228 = 80.1	
1	234	19576	19576/234 = 83.7	100*(83.7-80.1)/80.1 = 4.5%
2	183	17633	17633/183 = 96.4	100*(96.4-83.7)/83.7 = 15.2%
3	150	18870	18870/150 = 125.8	100*(125.8-96.4)/96.4 = 30.5%

Avg. = 16.7%

Weld Mill Dept.

	Labour	Output	Productivity	Prod. Growth
Year	(1000 hr)	(1000 ft)		
0	132	22434	22434/132 = 170.0	
1	157	34777	34777/157 = 221.5	100*(221.5-170.0)/170.0 = 30.3%
2	102	26715	26715/102 = 261.9	100*(261.9-221.5)/221.5 = 18.2%
3	77	25227	25227/77 = 327.6	100*(327.6-261.9)/261.9 = 25.1%

Avg. = 24.5%

Yes, labour productivity has increased in both departments. Weld Mill dept's productivity growth is larger than Cold Draw's (24.5% per year vs 16.7%).
This could be due to higher labour content of weld Mill (recall that the changes were mostly labour related).

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12.

HBC:	Year 3	Year 2	Year 1	
Sales	7.1	7.3	7.3	
EBIT	0.13	0.17	0.18	
Total cost	6.97	7.13	7.12	
Productivity	1.019	1.024	1.025	1.023
				avg
Wal-Mart:	**Year 3**	**Year 2**	**Year 1**	
Sales	285	256	230	
COS	220	199	178	
OSGA	51	45	40	
Total cost	271	244	218	
Productivity	1.052	1.049	1.055	1.052
				avg

Wal-Mart was more productive bec. its avg. productivity measure ($1.052 sales per $ cost) was larger than HBC's ($1.023 sales per $ cost).

13. a.

	Year 1	Year 2	Year 3
Sales	16.6	16.6	15.5
Payroll & benefits	4.3	4.3	4.0
Labour productivity	3.8605	3.8605	3.8750
% growth	--	0.0000	0.0038

Labour productivity ($ sales per $ wage) increased slightly in Year 3 (0.38% relative to Year 2).

b.

	Year 1	Year 2	Year 3
Sales	16.6	16.6	15.5
Operating costs			
Food & paper	5.5	5.9	5.2
Payroll & benefits	4.3	4.3	4.0
Occupancy (lease, etc)	3.9	3.8	3.5
	13.7	14.0	12.7
Multifactor productivity	1.2117	1.1857	1.2205
% growth	--	-2.14%	2.93%

Multifactor productivity ($ sales per $ cost) decreased in Year 2 (-2.14% relative to Year 1), but increased in Year 3 (2.93% relative to Year 2).

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14.

Lanigan				
Year	Production	Employees	Productivity	Growth
1	2,025	364	5.5632	
2	2,023	378	5.3519	-3.799%
3	1,471	402	3.6592	-31.627%
4	1,907	441	4.3243	18.175%
			avg =	-5.75%
Rocanville				
Year	Production	Employees	Productivity	Growth
1	1,833	328	5.5884	
2	2,573	340	7.5676	35.417%
3	1,897	343	5.5306	-26.918%
4	2,647	354	7.4774	35.200%
			avg =	14.57%

Productivity declined in both facilities in Year 3 (bec. of drop in production, probably due to drop in sales). Over years 2-4, Rocanville's productivity has increased (by an avg. of 14.57%), but Lanigan's productivity has decreased (by an avg of 5.75%).

15. Before: Productivity = output/input = 1 / (29/60) = 2.07 bricks per minute
After: Productivity = output/input = 1 / (10/60) = 6 bricks per minute
% increase = 100(6 – 2.07) / 2.07 = 190%

16. Number of employees = 3.
Each employee earns $25/hour and works 40 hours/week.
Each employee identifies an average of 3,000 leads per week.
The sign-up rate is 4% of the leads identified.
Revenue per sign-up = $70.
Material costs = $1,000 per week.
Overhead costs = $9,000 per week.

Multifactor Productivity (fees generated per dollar of input)

$$MFP = \frac{3{,}000\ leads/employee\ x\ 3\ employees\ x\ .04\ signups/lead\ x\ \$70/signup}{(3\ employees\ x\ 40\ hours/employee\ x\ \$25/hour) + \$1{,}000 + \$9{,}000}$$

$$MFP = \frac{\$25{,}200}{\$13{,}000} = 1.94$$

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17. Appropriate measure of CPR's labour (employee) productivity

= Gross ton-miles / Total employees (avg)

The labour productivity for each year of 2014-2016 period:

Performance Indicator	**2014**	**2015**	**2016**
Gross ton-miles (millions)	272,862	263,344	242,694
Train miles (thousands)	36,252	34,064	30,373
Average train length (feet)	6,682	6,935	7,217
Total employees (average)	14,604	13,858	12,082
Employee productivity	272,862/14,604 = 18.68	263,344/13,858 = 19.00	242,694/12,082 = 20.09

Its pattern over time is increasing.

18. Human weaver's labour productivity = (3.6)(6) m^2 / 4,000 hours = 21.6 / 4,000 = 0.0054 m^2 per hour
Machine's productivity = (3.6)(6) m^2 / 0.5 hour = 21.6 / 0.5= 43.2 m^2 per hour
The machine is 43.2 / 0.0054 = 8,000 times more productive.

Answers to Canadian Pacific Mini-Case

1. Cost

2.

a: Facility
b: Capacity
c: HR
d: Facility
e: HR
f: Capacity
g: Capacity

Answers to Competing the Loblaw Way Mini-Case

1. Cost

2.
- Facility
  - owns (rather than leases) the stores
- Capacity
  - matches the size of the store to the market: range from larger stores such as Superstores to medium-size stores such as Extra Foods to smaller stores such as Cash & Carry. Loblaw has expanded with the purchase of Shoppers Drug Mart.
- Vertical Integration/outsourcing
  - By using more private label brands such as President's Choice, No Name, and Joe Fresh Loblaw has assumed more responsibility in product design and manufacture.

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- Supplier Relationship/partnership
  - buys in large volumes & low cost (hence opportunistic purchasing rather than supplier partnership). Has centralized purchasing (and merchandizing & marketing).
- Product Mix and New Products
  - wide selection of groceries; Private label products such as No-name, President's Choice, Joe Fresh, etc., and these are expanding; one-stop shopping: non-food items such as pharmacy, financial services.
- Process Types and Technology
  - bar codes & scanners; in-store information system to determine item profitability
  - Web page
  - Click & Collect
- Human Resources
  - tries to control its labour cost
- Quality
  - Royalty PC Plus program
- Operations Infrastructure and Systems
  - efficient supply & distribution network
  - information technology (SAP)

Answers to WestJet's Strategy Mini-Case

1. "Visiting friends and relatives" market.

2. Cost

3.

Initial Principle	Advantages
Short-distance flights	No need to carry food
Single class of passengers (no first or business class)	Better utilization of seating space (note: the emphasis was on discount airfares)
No seat assignment	Faster boarding
Use only one type of aircraft: Boeing 737	Cheaper training of pilots and maintenance technicians
Fly to smaller cities	Faster turn-around time; cheaper airport fee
Recruit young enthusiastic employees whose salary is slightly lower than average, but who receive profit-sharing bonuses, Employee share-purchase program	Motivation
Emphasize "fun and friendly culture" and empower the employees (i.e., bottom-up management)	Non-unionized; better customer service
Use equity financing and tight financial controls	Little interest paid on loans; saves money
Use paperless tickets	Saves costs
No connecting flights and no baggage transfers	Saved costs; on-time flights
No frequent flyer program	Saved costs

4.

- Has replaced older planes with new fuel-efficient, low-maintenance planes that are operated longer each day
- The new planes have winglets at the end of their wings to increase lift and reduce drag
- Having a higher load factor (utilization of seats)

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