



MSCI 102: Introduction to Operations Management

Seminar solutions: Operations as a System

Operations as a **SYSTEM** –Recap

- Thinking of Operations as a system essential for our understanding
- Complex whole, where sub-systems interact with each other, modifying their relationships, and producing qualitatively new characteristics and behaviour
- All the time maintaining & reproducing distinct structures & boundaries...of the system and its subsystems
- Systems exhibit certain properties...**Purpose, Hierarchy, Adaptation, Transformation**
- With 'objectives', typically **Cost, Quality, Speed, Dependability, & Flexibility**
- How objectives can be **order winning, qualifying, or less important**
- How the contribution to higher purpose can be stratified as **holding firm back, as good as competition, best in industry or redefining industry expectations**
- **Over-adaptation vs under-adaptation**
- The **Volume-Variety** relationship

Operations as a systems

Task

Assess two local service operations whose operations are visible and probably known to you – Greggs campus outlet and Stagecoach bus services in Lancaster:

1) Purpose

- What is their relative emphasis on objectives like cost, quality, speed, dependability, flexibility – and are there others?
- Which of these are 'order-winning', 'qualifying' or 'other' factors?
- In what ways is the operation holding the firm back? making it as good as its competitors? making it the best in the industry? redefining industry expectations?

Purpose: System objectives



Purpose: Operations as a systems

- What is their relative emphasis on objectives like cost, quality, speed, dependability, flexibility – and are there others?
- But:
 - A heterogeneous customer population may mean ambivalence over certain objectives (e.g. speed at both)
 - It may be hard to define some satisfactorily, again given customer heterogeneity (e.g. quality at both)

Purpose: Operations as a systems

- Which of these are 'order-winning', 'qualifying' or 'other' factors?

			<i>Order-winning, qualifying or less important?</i>	
	<i>Importance</i>			
<i>Objective</i>	<i>Greggs</i>	<i>Stagecoach</i>	<i>Greggs</i>	<i>Stagecoach</i>
Cost	4	5	Q	Q
Quality	4	3	W	Q
Speed	5	4	Q	LI
Dependability	4	4	Q	W
Flexibility	3	2	LI	LI

Purpose: Operations as a systems

- Which of these are 'order-winning', 'qualifying' or 'other' factors?

			Order-winning, qualifying or less important?	
	Importance			
Objective	Greggs	Stagecoach	Greggs	Stagecoach
Cost	4	5	Q	Q
Quality	4	3	W	Q
Speed	5	4	Q	LI
Dependability	4	4	Q	W
Flexibility	3	2	LI	LI

- But:
 - Customer heterogeneity again: some may be much more sensitive to differences in attainment of the objectives
 - This may be irrelevant to a monopoly supplier

Purpose: Operations as a systems

- In what ways is the operation holding the firm back? making it as good as its competitors? making it the best in the industry? redefining industry expectations?

<i>Objective</i>	<i>Importance</i>		<i>Order-winnig, qualifying, or less-important?</i>		<i>Holding the firm back? Making it as good as its competitors? Making it the best in industry? Redefining industry expectations?</i>	
	<i>Greggs</i>	<i>Stagecoach</i>	<i>Greggs</i>	<i>Stagecoach</i>	<i>Greggs</i>	<i>Stagecoach</i>
Cost	4	5	Q	Q	AGAC	AGAC
Quality	4	3	W	Q	BII	AGAC
Speed	5	4	Q	LI	AGAC	AGAC
Dependability	4	4	Q	W	AGAC	AGAC
Flexibility	3	2	LI	LI	AGAC	AGAC

Purpose: Operations as a systems

- In what ways is the operation holding the firm back? making it as good as its competitors? making it the best in the industry? redefining industry expectations?

Objective	Importance		Order-winnig, qualifying, or less-important?		Holding the firm back? Making it as good as its competitors? Making it the best in industry? Redefining industry expectations?	
	Greggs	Stagecoach	Greggs	Stagecoach	Greggs	Stagecoach
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Speed	5	4	Q	LI	AGAC	AGAC
Dependability	4	4	Q	W	AGAC	AGAC
Flexibility	3	2	LI	LI	AGAC	AGAC

- But:
 - There may be heterogeneity in the operation – e.g. Stagecoach has different competitors for different routes
 - It may depend how widely you define ‘the industry’ the operation is in

Transformation: Operations as a systems

- Assess two local service operations whose operations are visible and probably known to you – Greggs campus outlet and Stagecoach bus services in Lancaster:

3) Transformation

- What does the operation transform?
- What are the main transforming resources?
- What does it transform its inputs into – as main products and by-products?
- Is it a material, information or customer processor – or some combination?
- How would you describe its variety and volume?
- What type of operation does this variety and volume describe?
- What are the problems in being this type of operation?

Transformation: Operations as a systems

Greggs:

- What does the operation transform?
 - food ingredients, packaging, hungry customers
- What are the main transforming resources?
 - staff, simple equipment, premises and infrastructure, basic expertise
- What does it transform its inputs into – as main products and byproducts?
 - food products, less hungry customers, food waste, packaging waste
- Is it a material, information or customer processor – or some combination?
 - customer and material processor
- How would you describe its variety and volume?
 - moderate variety & volume so a 'service shop'
- What type of operation does this variety and volume describe?
 - achieving insufficient volume given limits to variety or v.v.
- What are the problems in being this type of operation?
 - dealing with changing demand profiles – it can't ignore these (it's not a mass service) or satisfy them (it's not a professional service)

Transformation: Operations as a systems

Stagecoach:

- What does the operation transform?
 - customers, fuel
- What are the main transforming resources?
 - vehicles and maintenance resources, drivers and maintenance staff
- What does it transform its inputs into – as main products and byproducts?
 - customers in different places, pollutants, road damage, vehicle wear and damage
- Is it a material, information or customer processor – or some combination?
 - customer and material (fuel) processor
- How would you describe its variety and volume?
 - In one sense low variety (for a given route) but in another sense high (multiplicity of routes); by intention high volume but very route dependent
- What type of operation does this variety and volume describe?
 - probably a mass service but this obscures route heterogeneity
- What are the problems in being this type of operation?
 - operating a fixed schedule and route network irrespective of demand (and therefore revenue)

Conclusions: Operations as a systems

- Characterising an operation often unsatisfactory – objectives etc can be vague, types of transformation can be ambiguous, nature of operation e.g. on variety-volume scale can be unclear
- Inferences we make from this may not be very confident – is there requisite variety? Is there a reasonable trade-off of cost and variety?
- But this is a necessary way-in to understanding an operation, its role and its challenges

Questions



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Thank you.
