Concept Testing

Teaching materials to accompany:

*Product Design and Development*

*Chapter 8*

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Product Development Process

- Planning
- Concept Development
- System-Level Design
- Detail Design
- Testing and Refinement
- Production Ramp-Up

Qualitative Concept Testing

Quantitative Concept Testing
Concept Development Process

Mission Statement

- Identify Customer Needs
- Establish Target Specifications
- Generate Product Concepts
- Select Product Concept(s)
- Test Product Concept(s)
- Set Final Specifications
- Plan Downstream Development

Development Plan

Perform Economic Analysis

Benchmark Competitive Products

Build and Test Models and Prototypes
Concept Testing is Used for Several Purposes

• Go/no-go decisions
• What market to be in?
• Selecting among alternative concepts
• Confirming concept selection decision
• Benchmarking
• Soliciting improvement ideas
• Forecasting demand
• Ready to launch?
Concept Testing Process

- Define the purpose of the test
- Choose a survey population
- Choose a survey format
- Communicate the concept
- Measure customer response
- Interpret the results
- Reflect on the results and the process
Concept Testing Example: emPower Electric Scooter
Scooter Example

• Purpose of concept test:
  – What market to be in?

• Sample population:
  – College students who live 1-3 miles from campus
  – Factory transportation

• Survey format:
  – Face-to-face interviews
Communicating the Concept

- Verbal description
- Sketch
- Photograph or rendering
- Storyboard
- Video
- Simulation
- Interactive multimedia
- Physical appearance model
- Working prototype
Verbal Description

• The product is a lightweight electric scooter that can be easily folded and taken with you inside a building or on public transportation.

• The scooter weighs about 25 pounds. It travels at speeds of up to 15 miles per hour and can go about 12 miles on a single charge.

• The scooter can be recharged in about two hours from a standard electric outlet.

• The scooter is easy to ride and has simple controls — just an accelerator button and a brake.
Sketch
Rendering
Storyboard
3D Solid CAD Model
Appearance Model
Working Prototype
Beta Prototype
Video
Animation
Interactive Multimedia
Live Demonstration
Survey Format

• **PART 1, Qualification**
  – How far do you live from campus?
    • *If not 1-3 miles, thank the customer and end interview.*
  – How do you currently get to campus from home?
  – How do you currently get around campus?

• **PART 2, Product Description**
  – *Present the concept description.*
PART 3, Purchase Intent

If the product were priced according to your expectations, how likely would you be to purchase the scooter within the next year?

- I would definitely not purchase the scooter.
- I would probably not purchase the scooter.
- I might or might not purchase the scooter.
- I would probably purchase the scooter.
- I would definitely purchase the scooter.

“second box”

“top box”
Survey Format

• PART 4, Comments
  – What would you expect the price of the scooter to be?
  – What concerns do you have about the product concept?
  – Can you make any suggestions for improving the product concept?

• Thank you.
Interpreting the Results: Forecasting Sales

\[ Q = N \times A \times P \]

- \( Q \) = sales (annual)
- \( N \) = number of (annual) purchases
- \( A \) = awareness \times availability (fractions)
- \( P \) = probability of purchase (surveyed)

\[ = C_{\text{def}} \times F_{\text{def}} + C_{\text{prob}} \times F_{\text{prob}} \]

“top box”

“second box”
Forecasting Example: College Student Market

- N = off-campus grad students (200,000)
- A = 0.2 (realistic) to 0.8 (every bike shop)
- P = 0.4 x *top-box* + 0.2 x *second-box*
- Q =
- Price point $795
Forecasting Example: Factory Transport Market

- $N = \text{current bicycle and scooter sales to factories (150,000)}$
- $A = 0.25 \text{ (single distributor’s share)}$
- $P = 0.4 \times \text{top-box} + 0.2 \times \text{second-box}$
- $Q = 150,000 \times 0.25 \times [0.4 \times 0.3 + 0.2 \times 0.2]$
  \[= 6000 \text{ units/yr}\]
- Price point $1500$
emPower’s Market Decision: Factory Transportation

Still walking?
Production Product
Sources of Forecast Error

- Word-of-Mouth Effects
- Quality of Concept Description
- Pricing
- Level of Promotion
- Competition
Discussion

• Why do respondents typically overestimate purchase intent?
  – Might they ever underestimate intent?
• How to use price in surveys?
• How much does the way the concept is communicated matter?
  – When shouldn’t a prototype model be shown?
• How do you increase sales, Q?
• How does early (qualitative) concept testing differ from later (quantitative) testing?