
LINKS Marketing Principles Simulation

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Introduction

"A company can outperform rivals only if it can establish a difference that it can preserve. Competitive strategy is about being different, deliberately choosing a different set of activities to deliver a unique value mix." – Michael Porter

In the LINKS Marketing Principles Simulation, your team manages a firm in the set-top box industry. You'll be competing against other firms in your own simulated industry. Your goal in the LINKS Marketing Principles Simulation is to improve your firm's long-run financial performance.

As your team assumes managerial control at the end of quarter 3, your set-top box firm's product line consists of two products, a low-quality low-priced product 1 and a high-quality high-priced product 2 ("high-quality" or "higher-quality" to some customers, at least). Both products are profitable at the end of quarter 3, although profitability varies by product and market region.

All firms in your industry have been emulating each other for some time, so your competitors have exactly the same products, priced and marketed identically. While your firm and your competitors have had the identical marketing programs in place throughout quarters 1, 2, and 3, there are some differences in market standing due to the normal randomness inherent in the sales generation process in the set-top box industry.

Within the LINKS Marketing Principles Simulation, your team's performance will be evaluated based on a multi-factor, balanced scorecard evaluation system that includes financial, operational, and customer-facing performance metrics. Details are provided in the "Performance Evaluation" section of this participant's manual for the LINKS Marketing Principles Simulation.

Why Use Simulations?

"I hear and I forget; I see and I remember; I do and I understand." – Confucius

Why use simulations in management education? Why not use traditional classroom lectures, perhaps combined with case studies? Adults learn best by doing. "Doing" involves taking responsibility for one's actions, receiving feedback, and having an opportunity to improve through time. In management education and training settings, management simulations support learning in a non-threatening but competitive environment of the kind that real managers face every day.

Like an airline pilot flight simulator, a management simulator allows rapid time compression, quick feedback to the learner, and is a low-risk process (except to one's ego). A well-designed management simulator can provide the student with a realistic education and training experience in the relative safety of the simulation's operating environment. And, perhaps more importantly, the lessons learned in the management simulator environment occur within hours or days, not the months, quarters, or years associated with real life.

Here are the classic reasons to favor management simulations in adult-learning environments. Compared to traditional lecture/case/discussion educational events, simulations:

- Reflect active not passive participation, enhancing learning motivation.

- Apply key management concepts, especially coordination and planning.
- Demand analysis and decisions in the context of market-based feedback in the presence of thoughtful, vigilant competitors.
- Provide rapid feedback, encouraging participants to learn from their successes and failures within a relatively low-risk competitive environment.
- Provide learning variety through novel learning environments.

Some General Advice About LINKS

Based on extensive observations of the performance of thousands of past LINKS participants, these general suggestions and summary-advice nuggets are of well-proven value:

- Read and re-read this LINKS participant's manual (there's lots of good stuff in it).
- Regularly think about general business and management principles and how they might relate to and work within LINKS.
- You don't have to know everything about the LINKS set-top box industry at the beginning of the exercise, but you must consistently increase your knowledge base through time.
- "Share toys" (i.e., work hard at sharing your useful fact-based analyses and important insights with all members of your LINKS team). "Knowing" something important personally is only a part of the LINKS management challenge. Exploiting that knowledge effectively throughout all of your LINKS team's deliberations, with and through your whole LINKS team, is the key to harvesting the maximum ROI from your data, facts, analysis methodologies, insights, and knowledge.
- Get the facts and base your decisions on the facts, not on wishes, hopes, and dreams.
- Continually strive to see the whole demand-chain within the LINKS set-top box industry. Don't focus myopically on a single part of the LINKS demand-chain without regard for how it relates to, and is influenced by, other LINKS parts and to the "whole" of LINKS. The source of the "LINKS" name is the simulation's focus on managing the interrelationships, the linkages, among all demand-chain elements.
- Volume, sales, and market share are easy to obtain, if there are no constraints on profitability. Profitable volume is the "holy grail" in business and in LINKS.

The Marketplace

"Just because the river is quiet does not mean the crocodiles have left." – Malay Proverb

LINKS firms manufacture and market set-top boxes. A set-top box is a high-tech electronics product purchased by individual consumers for home use and by a wide range of businesses for office and manufacturing/operations environment uses. LINKS set-top boxes are "fourth generation" versions which include telephony applications (such as internet-based long-distance calling, interactive video conferencing, and interactive TV), local-area wireless networking, control/monitoring of a wide range of within-area electrical appliances and devices, digital media server, basic virtual reality, and teleportation enhancement capabilities.

Your particular set-top box sub-category is hyperware. Your firm has two products, referenced as "f-p" (for firm "f" and product "p"). For example, product 4-1 refers to product 1 of firm 4. Your manufacturing plant in market region 1 produces finished set-top boxes that are shipped to customers in all channels and market regions served by your firm.

There are two sales channels within LINKS market regions: retail and direct. You may choose to distribute your set-top box products in either, both, or neither channels in each market region. ("Neither" is the same as dropping a product from active distribution in a channel and region.)

- **Channel 1 is a retail channel.** The retail channel serves individual consumers who purchase set-top boxes for home use and businesses with set-top box needs. Retailers stock set-top boxes, along with an array of other similar and complementary electronic products. Retailers provide point-of-purchase support for in-person shoppers.
- **Channel 2 is a direct channel.** In the direct channel, firms sell set-top boxes directly to final customers via an e-commerce channel. Since your firm sells to final consumer and business-to-business end-users in the direct channel, the price in the direct channel is the final price paid by customers.

Alternative distribution channels reach common and distinct customers, so the channels partially compete with each other. Some customers will only purchase a set-top box product if it's available in their preferred distribution channel. Other customers will purchase set-top box products from any available channels (perhaps with channel preferences), to the extent that multiple channel options are available. Another source of sales for new channels is channel-captive customers. Channel-captive customers have not purchased in the past due to the absence of products being sold via their strongly preferred channel, the channel to which they are captive. Markets can grow (i.e., total category sales volume can increase) as firms open new channels, since captive customers in non-available channels do not purchase unless products are available in the preferred channel. Differential order processing costs accrue for sales in these two channels. In all regions, these order processing costs are \$4/unit and \$24/unit in channels 1 ("Retail") and 2 ("Direct"), respectively.

Each LINKS decision round is one calendar quarter. There is no known time-of-year seasonality within the hyperware product sub-category of interest in LINKS.

The LINKS currency unit is the LCU ("LINKS Currency Unit"), abbreviated "\$" and pronounced Ldollar ("el-dollar"). The "LINKS Currency Unit" (LCU) is a Euro-like multi-country currency.

Additional Web-Based Resources

In addition to this participant's manual, there are many resources on the LINKS website to support your work with LINKS. The LINKS website's URL is:

<http://www.LINKS-simulations.com>

You may find it useful to have a copy of the LINKS decision forms for use during your team deliberations. To access/download the Word doc file containing the decision forms, point your favorite browser to this case-sensitive URL:

<http://www.LINKS-simulations.com/MP/dvformsMP.doc>

This participant's manual for the LINKS Marketing Principles Simulation includes a large number of tabular exhibits. To facilitate convenient access to these exhibits for on-going referencing during your LINKS exercise, these exhibits have been included in an Excel spreadsheet. To access/download this Excel spreadsheet, point your favorite browser to this case-sensitive URL:

<http://www.LINKS-simulations.com/MP/ExhibitsMP.xls>

Decisions

"Success doesn't come to you. You go to it." – Marva Collins

In the LINKS Marketing Principles Simulation, you'll be responsible for these decisions each decision round (quarter):

- **Product Development:** Product configuration/reconfiguration decisions.
- **Generate Demand:** Price, marketing spending, marketing mix allocation, communications positioning, promotional program, and introduction/drop decisions for each product, channel, and region.
- **Service:** Service outsourcing level in each region.
- **Forecasting:** Next-quarter sales volume forecasts for each product, channel, and region.
- **Other Decisions:** Firm name.
- **Research Studies:** Ordering specific marketing research studies.

All decisions (except research studies decisions that are only for the next quarter) are permanent standing orders in LINKS. If you're happy with a current decision, no explicit decision change is required.

Set-Top Box Configurations

Each of your two set-top box products is defined by a configuration that is expressed as a six-character code with the following elements and interpretations:

- (1) Product form: "H" for the hyperware sub-category of set-top boxes
- (2) Raw material alpha: 0-9 (number of kilograms)
- (3) Raw material beta: 0-9 (number of kilograms)
- (4) Bandwidth: 1-7 (terahertz)
- (5) Warranty: 0, 1, 2, 3, or 4 (length of warranty in quarters)
- (6) Packaging: "1" (standard), "2" (premium), or "3" (environmentally sensitive premium).

For example, H55321 is a hyperware set-top box with 5 kg of raw material alpha, 5 kg of raw material beta, bandwidth of 3 terahertz, warranty of 2 quarters, and standard packaging. Product configuration influences manufacturing and post-sale costs in known fashions (detailed below).

FAQ

"Is it possible to have region-specific product configurations?" No, a product's configuration is the same in all channels and market regions. Each product may have only one configuration at a time. With varying customer preferences by channel and region, the implication is that trade-offs may be required in meeting customers' heterogeneous preferences. It is, of course, possible to target a product's configuration toward the preferences of particular customers. But, that might be to the detriment of customers in other channels or regions who prefer alternate configurations.

Hyperware sub-category set-top boxes require a gamma sub-assembly component and an epsilon sub-assembly component. A variety of suppliers provide sub-assembly components and alternative suppliers' offerings are fully interchangeable in manufacturing. Thus, since their particular "value" (supplier) doesn't impact configuration, sub-assembly components are not a formal part of the set-top box configuration.

You'll need to conduct appropriate research to assess customers' preferences for alpha and beta in set-top boxes. For bandwidth, warranty, and packaging, "more-is-always-better" for all customers and all markets. However, larger or smaller alpha and beta levels could be preferred by customers in particular markets, channels, and regions. Larger alpha and larger beta values are not necessarily preferred. Set-top box customers may prefer particular alpha and beta levels (not necessarily equal, of course), with deviations from preferred alpha and beta levels resulting in lower-quality customer perceptions.

Product Costs

The goal of your marketing efforts in this simulation is to improve your firm's long-run financial performance. Product repositionings influence both revenues and costs. Costs are obviously easier to forecast than sales volumes and revenues, since costs arise from within-firm manufacturing functions using existing technology. The following paragraphs provide relevant cost-related information that you'll need to take into account in your marketing efforts and in your efforts to manage your LINKS firm.

Your input and manufacturing costs for hyperware set-top box products are as follows:

- **Raw Materials:** Raw materials alpha and beta are single-grade commodities purchased at common world prices. In-bound transportation costs are covered by raw material suppliers. All raw materials are always delivered for use within the current quarter's production activities. The current prices of raw materials are \$3/kg for alpha and \$4/kg for beta. Raw materials vendors provide inbound just-in-time transportation as part of their bundled prices, so you never have any raw materials inventory.
- **Sub-Assembly Components:** Gamma and epsilon sub-assemblies cost \$17 and \$24 per unit, respectively. Customers (e.g., your firm) arrange and pay for the transportation associated with in-bound sub-assembly components. Gamma and epsilon sub-assembly components cost \$4/unit and \$6/unit, respectively, for transportation. Sub-assembly component suppliers provide just-in-time service, so you never have to carry any inventory. Gamma and epsilon sub-assembly have failure rates of 5.1% and 4.8% per quarter, respectively. These failure rates refer to in-field failure faced by customers. Note that a 1% failure rate is interpreted as a probability of 0.01 that a specific sub-assembly component fails in any quarter. These failure rates are especially relevant during your products' warranty periods when your firm must bear any costs associated with sub-assembly component failure.
- **Labor and Production:** Labor and production costs (per unit) for hyperware products are \$30 and \$20, respectively. Your manufacturing plant has the flexibility to produce on-demand so you never have any finished goods inventory.
- **Outbound Transportation Costs:** Customer shipment transportation costs per-unit for hyperware products sourced from your manufacturing plant in market region 1 are as follows: \$4, \$18, and \$26 per-unit for sales through channel 1 in market regions 1, 2, and 3, respectively, and \$8, \$28, and \$36 per-unit for sales through channel 2 in market regions 1, 2, and 3, respectively.
- **Replacement Parts:** Sub-assembly components may fail as customers use their set-top boxes. Within each product's warranty period, replacement parts are provided without cost by set-top box firms. The cost of shipping replacement parts to end-users is 50% of the cost associated with shipping finished products to customers.

Costs other than those related to raw materials, sub-assembly components, labor/production, and transportation are detailed below:

- **Bandwidth:** $\$10+0.5(T*T*T)$ where T is a product's terahertz rating. Bandwidth of 1 terahertz costs \$10.50 while bandwidth of 6 terahertz costs \$118. You have the engineering capability to include any level of bandwidth in your set-top box products, within the technology range 1-7. Bandwidth is a "more-is-better" attribute. Terahertz is just an industry-specific, generally-accepted metric describing the bandwidth performance of a set-top box. Customers will always prefer more bandwidth, but they might or might not prefer it enough to offset the additional bandwidth costs. You'd need to conduct appropriate research to assess customer preferences for higher bandwidth levels and then compare that preference to your input costs of providing higher bandwidth.
- **Warranty:** Set-top boxes may be configured with a warranty or with no warranty. With no warranty, there are no associated warranty costs. If you choose to offer a warranty, then the associated cost is $\$8+3(W*W)$, where W is the warranty length in quarters. For example, a one-quarter warranty costs \$11, a two-quarter warranty costs \$20, a three-quarter warranty costs \$35, and a four-quarter warranty costs \$56. Warranty coverage is outsourced to a reputable service provider in each market region. These warranty costs are paid directly to the outsourced warranty provider at the time the product is manufactured. Warranty costs do not depend on the failure rates of the sub-assembled components. Set-top box manufacturers are responsible for the costs associated with replacing sub-assembly components that fail in the field during the warranty period associated with a set-top box product. **Warranties are honored in the original calendar quarter of sale plus the additional number of quarters of the warranty associated with a product's configuration.**
- **Packaging:** "1" (standard) packaging costs \$10 per unit, "2" (premium) packaging costs \$14 per unit, and "3" (environmentally sensitive premium) packaging costs \$28 per unit. More expensive, premium packaging presumably has positive generate demand implications and provides greater physical protection during shipping, resulting in somewhat reduced failure rates in the field (i.e., lower failure rates to customers). "3" packaging denotes premium packaging with environmentally sensitive design, construction, and materials.

FAQ

"What is the full cost of providing set-top box warranties?" The full cost of warranties to set-top box manufacturers is the sum of three elements:

- ❖ the direct warranty cost, $\$8+3(W*W)$, where W is the warranty length in quarters
- ❖ the indirect costs that arise when sub-assembly components fail (set-top box manufacturers provide replacement parts without charge to the customer when sub-assembly components fail in the field within the warranty-period protection included with the original product purchase)
- ❖ the indirect costs associated with call center activity when customers require within-warranty service/support when sub-assembly components fail.

Reconfigurations

"Get the product out there as soon as you can and let the market judge how good it is. You can fix it as you go along." – William R. Hambrecht, Founder/Chairman/CEO of WR Hambrecht & Co.

Any change in the configuration of a set-top box is a product reconfiguration. **A reconfiguration**

involves a change in one or more of alpha, beta, bandwidth, warranty, and packaging. Any configuration change incurs charges of \$1,000,000, plus an additional \$100,000 per configuration element that is changed. These costs cover all of the necessary engineering, retooling, testing, and administrative activities related to implementing the reconfiguration request. If you reconfigure a set-top box by changing three of its elements simultaneously, the total associated reconfiguration cost is \$1,300,000. **Reconfiguration occurs immediately, so the next quarter's production involves the reconfigured product.**

Due to the workload associated with a reconfiguration, **you are limited to reconfiguring at most one product per quarter.** This single product reconfiguration may involve changing more than one element of a product's existing configuration.

Patents

"The best defense is to stay out of range." – Military Wisdom During Combat

Patent royalties are payable whenever a reconfigured product lies within the pre-existing protected patent zone for another hyperware set-top box product. In the quarter of reconfiguration, the protected patent zone is the sum of the absolute values of the alpha, beta, bandwidth, warranty, and packaging differences in two product configurations. For example, the product configurations H32111 and H45212 have a patent zone difference of $(4-3) + (5-2) + (2-1) + (1-1) + (2-1) = 6$.

Patent royalties are as follows: patent zone differentials of 0, 1, 2, 3, 4, 5, 6, and 7 points involve patent royalties of \$1,000,000, \$500,000, \$250,000, \$125,000, \$62,500, \$31,250, \$15,625, and \$7,812. No patent royalties are payable for patent zone differentials of eight or more.

Patent royalties are one-time payments made by manufacturers of patent-violating reconfigured products. Patent royalties are only payable in the quarter in which a patent-violating reconfiguration occurs. Royalties are paid by patent-violating reconfigurations to competitors whose patents are violated. That is, one firm's "royalties paid" are another firm's "royalties received."

FAQ

"If we reconfigure immediately by just one 'unit' (e.g., change Bandwidth by 1), what are the patent royalty implications?" Such a minor reconfiguration would violate all other firms' existing patent protection (in that set-top box category), since all firms' products are initially configured identically in each set-top box category. Thus, there would be some fairly substantial patent royalties to pay with such a minor reconfiguration.

Some additional considerations about patent royalties follow:

- (1) No patent royalties are paid by or paid to original quarter-1 product configurations by other firms' quarter-1 product configurations. However, any reconfigurations violating still-existing patents of quarter-1 product configurations are subject to patent royalty payments according to the schedule described above.
- (2) Patent royalties are payable only to pre-existing patents, not to competitors' products reconfigured simultaneously with your reconfiguration (i.e., in the same quarter that you reconfigure a product).
- (3) Multiple patent zone violations are possible on any reconfiguration. The patent royalty

- payments described above are payable for each patent zone violation.
- (4) Patent royalties (receipts and disbursements) are reported on your "Corporate P&L Statement."

Price Decisions

"Price is what you pay. Value is what you get." – Warren Buffett

You set prices for each actively distributed product in each channel and market region. The dealer channel price is the bulk-rate price for all units purchased for resale by dealers. The custom in the set-top box industry is to quote a single price regardless of order volume.

You do not control final selling prices in the dealer channel. Rather, your manufacturer price is marked up by some percentage amount by dealers in the various market regions. You will need to consult current research studies to determine average dealer prices for your products in the various market regions.

Prices affect customer demand in the usual fashion within the set-top box industry. Higher prices are normally associated with lower customer demand. The specific price sensitivities in the markets that you face in LINKS are unknown. You will need to learn about the markets' responsiveness to price through your experience in LINKS and by exploiting available LINKS research studies.

It's very easy to drop price to attempt to increase demand. However, it's always an interesting question whether that increased demand actually increases profits. Remember, **the price decrease that generates increased demand also reduces your margin on each unit sold.** More importantly, it's easy for competitors to see and feel threatened by a price change.

In addition to the physical costs of producing and distributing updated price sheets, lists, and databases that accrue when a manufacturer changes price (so-called "menu costs"), a range of indirect and non-obvious costs arise with price adjustments.¹

- **Managerial Costs:** A manufacturer must gather information, analyze, assess, and ultimately communicate the logic associated with price changes throughout their firm. Managerial costs presumably increase with larger price changes, since there is more to assess/analyze and more organizational members become involved with larger price changes.
- **Customer-Facing Costs:** When implementing price changes, a communications program must be created and executed to portray a price change in the most favorable light to

¹ Recent published research documents the range of direct and indirect costs associated with price adjustments for a large U.S. industrial manufacturer (more than one billion USD\$ revenues selling 8,000 products [used to maintain machinery] through OEMs and distributors). The authors found that managerial costs are more than 6 times, and customer-facing costs are more than 20 times, the so-called "menu costs" (physical costs) associated with price adjustments. In total, price adjustment costs comprise 1.22% of the company's revenue and 20.03% of the company's net margin. {Source: Mark J. Zbaracki, Mark Ritson, Daniel Levy, Shantanu Dutta, and Mark Bergen, "Managerial and Customer Costs of Price Adjustment: Direct Evidence From Industrial Markets," *The Review of Economics and Statistics*, Volume 86, Number 2 (May 2004), pp. 514-533.}

customers. In a B2B environment, price adjustments potentially involve (re)negotiation with those customers who are resistant to new (higher) prices.

In LINKS, each price change by your manufacturing firm for a product in a channel in a market region results in \$10,000 in costs **plus** \$200 in costs per-dollar change in price (increase or decrease in price) **plus** costs of 0.25% of current-quarter revenues.² For example, a \$75 change in price on a product with revenues of \$4,500,000 in a particular channel and region incurs price change costs of $\$10,000 + (\$200)(75) + (0.0025)(\$4,500,000) = \$10,000 + \$15,000 + \$11,250 = \$36,250$. These price change costs are recorded as "Price Changes" in the "Fixed and Other Costs" section of your firm's profit-and-loss statements in the quarter in which the price change occurs.

Marketing Spending Decisions

"Marketing is not the art of finding clever ways to dispose of what you make. It is the art of creating genuine customer value. It is the art of helping your customers become better off. The marketer's watchwords are quality, service, and value." – Philip Kotler

A marketing spending budget is required for each set-top box product in each channel and market region. This budget is managed by the relevant region managers in your firm and is used for advertising, promotion, and sales force efforts associated with your products. You are free to allocate funds to marketing spending as you see fit. Spending does not have to be equal in all channels and regions.

Marketing spending is thought to increase customer demand for set-top box products. Past industry practice has been to budget at least \$50,000/quarter in marketing spending in all channels and regions within which a set-top box product is actively distributed. It is thought that marketing spending's impact on customer demand declines at higher expenditure levels, but the precise form of the relationship between marketing spending and sales is unknown. You will have to learn about the influence of marketing spending on sales through your experience within the set-top box industry.

If you drop a product from a channel/region, you must change marketing spending to \$0. Otherwise, marketing spending continues to occur, in anticipation of a future relaunch.

In addition to overall marketing spending decisions for each product/channel/region, marketing mix allocation decisions are also required. Marketing mix allocation refers to the distribution of your specified marketing spending budget across advertising, promotion, and sales force programs in support of each product in each channel and region. Obviously, these three percentages must sum to 100% for each product in each channel and region.

Advertising programs are implemented by your firm's advertising agency in each channel and market region in which your firm operates. Your regional sales managers implement promotional and sales force programs in your channels and market regions. Sales force programs can

² Price change costs only accrue for products that are already actively being sold in a channel and region. No price change costs accrue for price changes for a product as it is being introduced into a channel and region (i.e., it was inactive in that channel and region in the last quarter).

include both internal sales representatives (company employees) and external sales representatives (independent sales representatives who work for several non-competing companies simultaneously).

Your 6-digit marketing mix allocation (excluding "%" symbols) specifies the 2-digit percentage allocations of your total marketing spending budget to advertising, promotion, and sales force programs, respectively. **You must allocate at least 10% of your marketing spending budget to each of advertising, promotion, and sales force.** For example, the 6-digit marketing mix allocation 113653 specifies that 11%, 36%, and 53% of the total marketing spending budget is to be allocated to advertising, promotion, and sales force programs, respectively. You are, of course, free to vary your marketing mix allocations across your products, channels, and regions, as you see fit.

Marketing Communications Positioning Decisions

"Advertising is what you do when you can't go see somebody." – Fairfax Cone

Each set-top box product in each market (channel and region) has a marketing positioning to guide advertising, promotion, and sales force efforts. Marketing positioning communicates the value proposition that a product offers to customers in a market.

Marketing positioning includes both "how to say it" (competitive positioning) and "what to say" (benefit proposition). LINKS firms select a two-digit marketing positioning code for each product in each market (channel and region).

| First Digit: "How To Say It" (Competitive Positioning) | Second Digit: "What To Say" (Benefit Proposition) |
|---|--|
| Examples of "how to say it" include marketing communications claims of more benefits for the same price as competitors or equivalent competitive benefits but at a lower price. | Examples of "what to say" include marketing communications claims of superiority in product quality, service quality, or availability either individually or in combination. |

Details follow about the specifics of "how to say it" (competitive positioning) and "what to say" (benefit proposition).

"How to say it" (competitive positioning), the first digit in a LINKS marketing positioning code, reflects a firm's decision about whether to focus on benefit(s) exclusively, price exclusively, or explicitly compare benefit(s) to price within marketing positioning. Your firm may use the adjectives "more," "same," or "less" to describe your product offering relative to competing products targeted at a specific market segment in a particular market (channel and region).

Different combinations of these competitive positioning options (benefits and price) produce eight meaningful marketplace positions. These eight competitive positioning options, and their associated LINKS codes, are described in the following table. Dominated options, such as less benefits at a higher relative price, are "blacked out" (i.e., infeasible) because they are always inferior to other competitive positioning options.

| | | "Benefit" | | | |
|--------------|------------|----------------------------------|------|------|---------------------------------------|
| | | More | Same | Less | No Mention |
| Price | More | 1 | | | 7 (Exclusive Price Emphasis) |
| | Same | 2 | 3 | | |
| | Less | 4 | 5 | 6 | |
| | No Mention | 8 (Exclusive "Benefit" Emphasis) | | | |

“What to say” (benefit proposition), the second digit in a LINKS marketing positioning code, is an articulation of the specific benefit(s) offered by a product. These benefits are what the customer receives from purchasing and using a set-top box product. For example, a set-top box product might provide benefits because it is better designed to match customer preferences, it delivers a superior service experience, or it is more accessible/available to customers. In LINKS, the specific benefit emphasis possibilities include product quality, service quality, and availability.

- "Product Quality" is perceived product quality, reflecting customers' perceptions of a product's configuration and its reliability and performance in actual usage.
- "Service Quality" is perceived service quality, reflecting customers' perceptions of the service quality associated with a product. Service quality derives from experiences with a firm's regional call centers.
- "Availability" is perceived product availability, reflecting customers' perceptions of a product's top-of-mind awareness, channel presence, distribution accessibility, ease of access, convenience to purchase, and general presence/prominence in the market place.

A product's marketing positioning may focus on one, two, or all three of these benefits. Note that price is not a benefit to customers, but rather reflects the economic cost incurred to obtain the offering's benefit(s). Price positioning is included within the first part of the marketing positioning decision, "how you say it" (competitive positioning).

Your firm may choose to emphasize Product Quality, Service Quality, and/or Availability individually, in pairwise combination, or collectively in a product's marketing positioning using these benefit(s) proposition codes.³

| | |
|---|--|
| 1 | Product Quality |
| 2 | Service Quality |
| 3 | Availability |
| 4 | Product Quality and Service Quality |
| 5 | Product Quality and Availability |
| 6 | Service Quality and Availability |
| 7 | Product Quality, Service Quality, and Availability |

Some examples of two-digit LINKS marketing positioning codes follow:

- A LINKS marketing positioning code of 81 is an exclusive benefit emphasis on product quality, presumably related to distinctive configuration/design elements of importance to customers.
- A LINKS marketing positioning code of 24 is a "more-benefits-for-same-price" competitive positioning with "benefits" referencing product quality and service quality.
- A LINKS marketing positioning code of 11 is a "more-benefits-for-more-price" competitive positioning with "benefits" referencing product quality. This is a "more-benefits-for-more-price-but-worth-it" kind of marketing positioning.

³ Exhibit 2 (Volume Drivers in LINKS) provides further details about the drivers of Product Quality, Service Quality, and Availability.

- A LINKS marketing positioning code of 71 is an exclusive price emphasis, presumably referencing low price compared to competitive offerings.⁴

When marketing positioning changes, various costs arise to refresh and update all advertising, promotion, and sales force documents, materials, graphics, visuals, and media. In total, these marketing creative development costs equal the greater of \$20,000 or 20% of marketing spending for a product in a market (channel and region). These marketing creative costs are recorded as "Marketing Creative" costs on your firm's profit-and-loss statements.

Promotional Program Decisions

A variety of promotional program options exist in LINKS. Generally, you may concentrate your promotion spending on the sales force, the channel, or on final customers. These specific promotional activity options and associated promotional program codes exist in LINKS:

| | |
|---|---|
| 1 | "Channel Training" (retail channel only) |
| 2 | "Sales Force Training" |
| 3 | "Customer Training" |
| 4 | "Customer Rebates" |
| 5 | "Trade Shows" (retail channel only) |
| 6 | "Event Marketing" |
| 7 | "Vendor Allowances" (retail channel only) |
| 8 | "Dealer Rebates" (retail channel only) |
| 9 | "Trade-In and Exchange Programs" |

Further details about available promotional codes and associated promotional activities follow:

- "Channel Training" is targeted at training channel members' employees (mainly retail sales representatives) in product specifics and competitive product benchmarking as well as providing resources, ideas, and insights into selling techniques.
- "Sales Force Training" involves programs to train sales representatives in product specifics, competitive product benchmarking, customer and channel analysis, selling skills, and professional/personal development.
- "Customer Training" involves special programs and print/audio/video/multi-media supporting materials to "train" (inform, education, and encourage) final customers in the benefits and operational use of set-top boxes. Since set-top boxes are a very new category to most customers, there are potential customer information gaps that "Customer Training" promotional efforts are designed to address.
- "Customer Rebates" are direct-to-customer (end user) discounts offered without disrupting regular "list prices" at which set-top boxes are normally sold. "Customer Rebates" offered regularly might become expected by customers, so it's probably unwise to offer consistent customer rebates on a quarter-after-quarter basis.
- "Trade Shows" involve participation in retail industry trade shows and in relevant trade shows of direct-channel channel customers.
- "Event Marketing" refers to a wide range of product-sponsored promotional and public relations events. Sporting teams and events (amateur and professional), high-profile entertainment events, arts and cultural organizations, and local-market cultural attractions all represent opportunities for "Event Marketing."
- "Vendor Allowances" to dealers in the retail channel include payments for retailer promotional allowances and cooperative advertising, shelf-space and end-of-aisle positionings, and point-

⁴ If you choose an exclusive price emphasis for your competitive positioning (i.e., first digit of 7), then the second digit of the marketing positioning code (benefit proposition) is irrelevant.

of-purchase displays.

- "Dealer Rebates" are discounts offered to dealers in the retail channel without disrupting regular "list prices" at which set-top boxes are normally sold. Rather than passing on such dealer rebates to customers, dealers in the retail channel normally use such dealer rebates to enhance their margins. "Dealer Rebates" offered regularly might become expected by dealers, so it's probably unwise to offer consistent dealer rebates quarter-after-quarter.
- "Trade-In and Exchange Programs" involve special discounts offered to existing customers with installed set-top boxes to encourage trade-ins and upgrades. These discounts are typically offered both to "own" product upgrades as well as to competitor product upgrades.

Within your promotion sub-program, you may choose to have one promotion activity only or primary and secondary promotion activities. **If you choose to have primary and secondary promotion activities, two-thirds of your available promotion spending is allocated to your primary promotion activity with the residual one-third being allocated to your secondary promotion activity.**

Your 2-digit promotional activity code specifies your primary and secondary promotional activities. A second digit of zero ("0") is interpreted as your promotion program having no secondary promotional activity (i.e., your promotional efforts are directed at only one promotional activity). For example, the promotional code 36 specifies a primary promotion emphasis of customer training and a secondary promotion emphasis of event marketing.

Introduction/Drop Decisions

"The difference between selling and marketing is that selling is getting rid of what you have while marketing is having what people want." – Theodore Levitt

You may introduce products into channels and regions not currently active or drop products from channels and regions as you see fit. Introduction incurs a one-time cost of \$250,000. Dropping a product from active distribution in a channel or region incurs no special costs. Introduction costs are recorded under "Introductions" on your financial statements.

To "activate" a product in a channel/region, you must issue a specific introduction decision. Change the "Active Product?" status to "Yes" to introduce a product into a specific region. To drop a product from active status in a channel/region, change its "Active Product?" status to "No." **You only introduce a product into a channel/region once. Once a product is active in a channel/region, it continues to be active until you make an explicit drop ("No") decision.**

You must explicitly introduce or drop a product from a channel/region, regardless of your marketing spending and your sales volume forecasts. Setting marketing spending to zero does not result in the associated product being dropped from that channel/region.

If you drop a product from a channel/region, you must change marketing spending to \$0. Otherwise, marketing spending continues to occur, in anticipation of a future relaunch.

Your firm has a policy of limiting simultaneous new product-region-channel launches to a maximum of three in any quarter. For example, if you choose to launch a product in both channels of a region, that action represents a total of two new launches. A reconfiguration isn't a

launch if that product is already actively distributed in a channel or a region. However, if you reconfigure a product and launch (introduce) it into two channels in one region and one channel in another region, that represents three new launches and no other launches would be possible in that quarter.

Service Decisions

"It matters not whether a company creates ... a computer, a toaster, or a machine tool, or something you can only experience, such as insurance coverage, an airplane ride, or a telephone call. What counts most is the service built into that something - the way the product is designed and delivered, billed and handled, explained and installed, repaired and received." – Ronald Henkoff, "Service Is Everybody's Business," *Fortune* (June 27, 1994), p. 48

Service is outsourced in the LINKS Marketing Principles Simulation. Service outsourcing is provided by reputable call-center service providers in each region. You may freely choose from among the four available service outsourcing options/levels in each region, in addition to level "0" ("None" which implies no service is provided). Their per-call costs and associated guaranteed service quality performance levels ("SQ Guarantee") are detailed below:

| Service Outsourcing Level | | Region 1 | Region 2 | Region 3 |
|---------------------------|---------------------------|-------------|-------------|-------------|
| "Minimum" [1] | Cost/Call SQ Guarantee | \$6 10% | \$7 10% | \$8 10% |
| "Standard" [2] | Cost/Call SQ Guarantee | \$10 20% | \$12 20% | \$13 20% |
| "Enhanced" [3] | Cost/Call SQ Guarantee | \$16 30% | \$18 30% | \$21 30% |
| "Premium" [4] | Cost/Call SQ Guarantee | \$24 40% | \$27 40% | \$32 40% |

These "SQ Guarantees" are long-run averages. Service-center outsourcers guarantee that perceived service quality won't vary by more than 3% from these averages in any quarter. Costs for call-center service outsourcing are reported as "Service Outsourcing" on your financial and operating reports. With service outsourcing, you automatically receive a summary "Service Center Operations Report" as part of your regular financial and operating reports.

Sales Volume Forecasting Decisions

"No amount of sophistication is going to allay the fact that all your knowledge is about the past and all your decisions are about the future." - Ian E. Wilson

Forecasting prowess reflects understanding of the generate demand drivers of any business. In LINKS, channel-specific and region-specific quarterly sales volume forecasts are required for each of your products.

Administrative overhead costs increase by 1% for every 1% inaccuracy in your sales volume forecasts. For example, a forecast error of 10% (whether positive or negative) increases the associated administrative costs for that product in that region by 10%. The maximum administrative overhead penalty associated with sales forecasting inaccuracy is a doubling of current administrative overhead.

Forecasting accuracy equals $100 \times (1 - (\text{abs}(\text{Forecast} - \text{Actual}) / \text{Actual}))$ expressed in percentage terms, where "abs" is the absolute value function. Thus, a forecast value of 11,000 and an actual value of 8,000 results in a forecast accuracy of $100 \times (1 - (\text{abs}(11,000 - 8,000) / 8,000)) = 100 \times (1 - (3,000 / 8,000)) = 100 \times (1 - 0.375) = 62.5\%$. The minimum possible value of forecasting accuracy is 0.0%. For example, with an Actual sales volume of 8,000, a Forecast above 16,000 results in a forecasting accuracy score of 0.0%.

The following page contains a judgmental sales forecasting worksheet that provides a template for systematically approaching the sales forecasting process. Judgmental adjustments are challenging, but at least you're explicitly taking into account that your generate demand program changes, and those of your competitors, influence your sales.

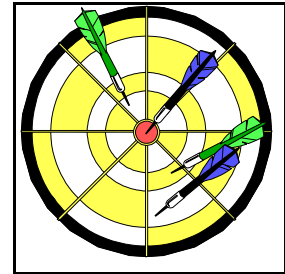
Firm Name

Your firm may choose a firm name. Any firm name with up to 40 characters is acceptable. This firm name is printed on the top of all financial, operating, and research reports. Firm names have no cost or known demand-side implications, so you are free to choose (or change) your firm's name as you wish.

Judgmental Sales Forecasting Worksheet

Sales forecasting drives everything in demand and supply chains. Unfortunately, sales forecasting is extraordinarily challenging due to the many factors influencing your sales (your current and recent generate demand programs, current and recent competitors' generate demand programs, and exogenous market forces).

Here's a judgmental sales forecasting process that, at a minimum, provides an organizational template to systematically approach the sales forecasting process. Judgmental adjustments are challenging, but at least you're explicitly taking into account that your generate demand program changes, and those of your competitors, influence your sales.



- **Step 1** (the "easy" part): Construct a trend-line extrapolation of past sales realizations based on a crucial assumption: future market and environmental forces will continue as they have existed in the recent past. Be watchful for structural considerations like channel loading (forward buying), unfilled orders, and backlogged orders.
- **Step 2** (the "hard" part): Make adjustments for planned changes in your generate demand programs. The potential impacts of changes in product, price, distribution, communications, and service on your sales must be quantified.
- **Step 3** (the "subtle" part): Account for foreseeable competitors' changes in their generate demand programs. It's easy to overlook competitors in forecasting. Assume that competitors are vigilant and thoughtful and present.

| | | |
|-------------------------|--|--|
| 1 | Trend-Line Extrapolation of Past Sales Realizations (Base-Line Forecast) | |
| 2 | Adjustments For Planned Changes In Generate Demand Program (list specifics, with judgmental estimates of sales impacts <i>[expressed in +/- %s]</i>) Product Changes Price Changes Distribution Changes Communications Changes Service Changes | |
| 3 | Adjustments For Foreseeable Changes In Competitors' Generate Demand Programs (list specifics, with judgmental estimates of sales impacts <i>[expressed in +/- %s]</i>) Product Changes Price Changes Distribution Changes Communications Changes Service Changes | |
| Adjusted Sales Forecast | | |

Marketing Research Studies

"Time spent in reconnaissance is seldom wasted." – Sun Tzu, 4BC

Research studies requests are submitted along with your other decision variable changes. Although LINKS research studies are ordered prior to the beginning of the next quarter, research studies are executed during and after the next quarter, as appropriate. Thus, research studies reports always reflect the just-completed quarter's experience.

The following research study descriptions include sample output to illustrate the style and formatting of research study output. The output should not be viewed as providing any specific insight into your particular set-top box industry.

The existence of any particular LINKS research study is not an implicit endorsement that such a research study is important, relevant, or even useful to the management of your LINKS firm. Rather, the inclusion of these research studies in LINKS reflects their real-world existence in a wide variety of industries and product/service categories. You must form your own opinion about the relative merits of these LINKS research studies and, in particular, whether each research study's potential value exceeds its monetary cost.

Which research studies should you purchase and when? Snappy but uninformative responses would be "purchase only research that you really need" and "it depends." Unfortunately, these responses are not very constructive counsel. Heavy-duty anticipatory thinking is needed before deciding on research study purchases. There are no universal answers about appropriate, needed, and desirable research studies, other than the principle that research is about uncertainty reduction. What don't you know? How important is it to "know" these things? Is there any research that might be conducted in a timely fashion to reduce this uncertainty?

FYI: The Cost of Marketing Research

Marketing research is more often than not underfunded. I continue to be amazed by companies that are extremely averse to spending \$200K on researching a new product that will cost \$40 million to launch — that's 1/2 of 1% of the money at risk. Or why is it so difficult to justify even 1% of the cost of an advertising or promotional campaign on conducting pre-launch evaluations of that campaign at the critical stages of development? There are several credible explanations.

- *One reason is that marketing campaigns too often take on a life of their own, with marketers' egos and reputations perceived to be on the line. To advocates, research is seen as a constraint on their personal prerogatives and creativity. Gunslinger marketers and well-trained, methodical researchers do not mix well.*
- *Researchers often aren't involved in the early planning process for new products or campaigns. Consequently, at the time of budget development, there's no input from the professional researcher as to what should be researched, how it should be researched, and how much it will cost.*
- *In most companies, spending on marketing research is considered an expense, not an investment in risk reduction. Until we develop and can agree on measures of return on marketing research investment, the marketing research function will continue to suffer the fate of short budgets and yo-yo staffing.*

Source: William D. Neal, "Getting Serious About Marketing Research," *Marketing Research: A Magazine of Management and Applications* (Summer 2002), p. 26.

In thinking about research studies strategy and tactics, some generalizations are possible:

- Excellent strategy can only be developed based on excellent analysis. Since research provides the raw data for excellent analysis, research should be an important component of your decision-making process. Do not relegate your research studies pre-ordering decisions to the last five minutes of team meetings. Rather, treat research studies ordering decisions as a fundamental part of your whole LINKS decision-making process.
- Plan ahead. To identify patterns and trends, you will probably need to order some research studies on a more-or-less regular basis. A formal research studies plan should be a part of your management planning process.
- Systematize the post-analysis of research studies. This might involve, for example, the continual updating of databases, charts, or graphs to reformat the raw LINKS research studies results into more meaningful and useful forms.
- Share insights derived from particular research studies with all of your LINKS team members. These may require research studies' "experts" to assume coaching roles with research studies "novices." This is a natural state of affairs. Given the complexity of LINKS, it is not possible to be an "expert" on everything.

Research Study #1: Benchmarking - Earnings

Purpose: This research study provides earnings benchmarks for your set-top box industry. The current-quarter earnings, cumulative-to-date earnings, and current-quarter dividends of each firm in your industry are reported. In addition, a variety of financial market statistics are reported.

Information Source: These data are based on public information.

Cost: \$500.

Sample Output

```

=====
RESEARCH STUDY # 1 (Benchmarking - Earnings)
=====

```

| | Current Net Income | Cumulative Net Income | Current Dividends |
|--------|-----------------------|--------------------------|----------------------|
| Firm 1 | 2,974,292 | 5,788,265 | 892,287 |
| Firm 2 | 3,472,461 | 6,234,171 | 1,041,738 |
| ... | | | |

Financial Market Statistics [stock price, shares outstanding (millions), earnings per share, dividends per share, market capitalization (\$millions)]

| | Firm 1 | Firm 2 | Firm 3 | Firm 4 |
|------------|--------|--------|--------|--------|
| StockPrice | 120.00 | 131.80 | 117.63 | 123.96 |
| Shares | 2.0M | 2.0M | 2.0M | 2.0M |
| ... | | | | |

Research Study #3: Benchmarking - Product Development

Purpose: Current configurations are reported for all actively-sold products. The last quarter in which each product was reconfigured is reported, with quarter "0" referencing reconfigurations which occurred prior to quarter 1.

Information Source: These research study results are based on reverse engineering efforts by your research supplier.

Cost: \$1,500 per competitor product.

Sample Output

```

=====
RESEARCH STUDY # 3 (Benchmarking - Product Development)
=====

```

| | | |
|-----------------------------|--------|-----------------------------|
| Product 1-1H Configuration: | H35112 | [reconfigured in quarter 3] |
| Product 1-2H Configuration: | H73212 | [reconfigured in quarter 8] |
| Product 2-1H Configuration: | H11111 | [reconfigured in quarter 0] |
| ... | | |

Research Study #9: Benchmarking - Generate Demand

Purpose: This research study provides generate demand benchmarks for your industry. Price and marketing statistics (minimum, average, and maximum) for each product category, market region, and channel are provided.

Information Source: This research study is based on information sharing and pooling agreements among all firms in the set-top box industry administered by the Set-Top Box Industry Trade Association.

Cost: \$5,000.

Sample Output

```

=====
RESEARCH STUDY # 9 (Benchmarking - Generate Demand )
=====
                                     Quarter 55   Quarter 56   Quarter 57   Quarter 58
-----
-----
HYPERWARE
REGION 1
min/ave/max
-----
CHANNEL 1:
  Price [$]           435 520 657   431 554 689   437 542 662   429 542 662
  Mktg [$K]           100 161 300     0 183 300     0 157 300     0 181 326
CHANNEL 2:
  Price [$]           440 495 540   440 496 550   440 499 550   440 496 550
  Mktg [$K]            0  85 150     75 134 282     0 139 299     0 147 326
...

```

Research Study #12: Market Statistics

Purpose: This research study provides a variety of market statistics for each region for the last four quarters:

- Industry demand (final customer purchases) is reported for the hyperware set-top box category.
- Overall market shares for each firm are provided for each of the last four quarters. These market shares are based on end-user customer purchase volumes and not on manufacturer orders.
- End-of-quarter retail-channel (channel 1) inventory holdings for active products are reported in two ways: units and quarters of inventory (expressed relative to the current quarter's retail-channel sales volume).
- Estimates of dealer-channel margins for active products are reported. "Margin" is dealer-channel volume times the dealer-channel markup.

Information Source: This research study is compiled by your research vendor using a variety of sources.

Cost: \$2,500.

Sample Output

```

=====
RESEARCH STUDY #12 (Market Statistics )
=====
                                     Quarter 11   Quarter 12   Quarter 13   Quarter 14
-----
-----
INDUSTRY DEMAND
Region 1 Demand       60,231      59,075      59,244      59,165
Region 2 Demand       21,988      23,306      23,136      22,930
...
OVERALL MARKET SHARES
Firm 1                 18.0        26.6        25.3        20.7
Firm 2                 19.5        17.4        18.8        17.9
Firm 3                 19.9        19.1        17.6        20.0
Firm 4                 21.7        19.8        19.7        19.6
Firm 5                 20.9        17.1        18.6        21.8
DEALER CHANNEL INVENTORY [Units]
Region 1:
  Product 1-1H         2,128       2,260       2,257       2,653
  Product 2-1H         2,178       2,377       2,345       2,266
  ...
Region 2:
  Product 1-1H         3,853       3,943       3,383       3,818
  ...
RETAIL CHANNEL INVENTORY [Quarters]
Region 1:
  Product 1-1H         0.38        0.33        0.40        0.39
  Product 2-1H         0.51        0.37        0.45        0.40
  ...
Region 2:
  ...
DEALER CHANNEL MARGIN
Region 1:
  Product 1-1H         1,459,436   1,608,804   1,743,830   1,244,650
  ...

```

Research Study #14: Regional Summary Analysis

"If you torture the data long enough, it will confess." – Anonymous

Purpose: This research study provides a regional summary analysis for each specified market region, including current-quarter market shares, prices, and perceptions of product quality, service quality, and availability of all active products:

- "Product Quality" is perceived product quality, reflecting customers' perceptions of a product's configuration and its reliability and performance in actual usage.
- "Service Quality" is perceived service quality, reflecting customers' perceptions of the service quality associated with a product.
- "Availability" is perceived product availability, reflecting customers' perceptions of a product's top-of-mind awareness, distribution accessibility, ease of access, convenience to purchase, and presence/prominence in the market place.

Sample Output

| RESEARCH STUDY #14 (Regional Summary Analysis) | | | | | | | |
|--|--------|--------------|--|-------|-----|-----|-----|
| REGION 1 HYPERWARE | Volume | Market Share | | Price | PQ | SQ | Av |
| Channel 1 | | | | | | | |
| 1-1 | 15,906 | 9.9- | | 707+ | 41 | 21- | 54+ |
| 4-1 | 531 | 0.3 | | 465 | 2 | 19 | 1 |
| 5-1 | 9,391 | 5.9 | | 439 | 9 | 29+ | 38 |
| 6-1 | 7,291 | 4.6 | | 417- | 8 | 41+ | 23- |
| 7-1r | 32,519 | 20.3+ | | 699+ | 58+ | 28 | 54+ |
| 8-1 | 16,096 | 10.1 | | 650 | 34- | 18- | 43 |
| Channel 2 | | | | | | | |
| 1-1 | 13,238 | 8.3- | | 670+ | 40- | 18- | 10- |
| 2-1 | 6,881 | 4.3+ | | 380- | 8 | 9- | 12- |
| 5-1 | 12,162 | 7.6+ | | 392 | 9 | 32+ | 23 |
| 6-1 | 7,427 | 4.6 | | 390- | 8 | 39+ | 12- |
| 7-1r | 25,428 | 15.9+ | | 650+ | 59+ | 32+ | 35+ |
| 8-1 | 13,225 | 8.3- | | 653 | 35 | 20- | 26 |

Notes:
 (1) "Volume" is sales volume in units.
 (2) Other variables listed above are market share, end-customer price ("Price"), perceived product quality ("PQ"), perceived service quality ("SQ"), and perceived availability ("Av").
 (3) Changes of more than 2%, \$20, 2%, 2%, and 2%, respectively, in these variables from the previous quarter are flagged with "+" (increase) and "-" (decrease) signals after the numerical values.
 (4) "r" after a firm#-product# denotes a reconfigured product this quarter.

Information Source: Perceived product quality, perceived service quality, and perceived availability are based on a survey of set-top box customers. These perceptual ratings are the percentages of survey respondents rating product quality, service quality, and availability as "excellent" on a 4-point "poor"- "fair"- "good"- "excellent" rating scale.

Cost: \$10,000 per region.

Additional Information: Your set-top box manufacturing firm sells to retailers in channel #1, not directly to final end-user customers. Retailers in channel #1 maintain inventory of your set-top box products as well as selling your products to their customers. Thus, final end-user customers sales volume and market share in channel #1 (for example, as reported in Research Study #14) aren't equal to your firm's sales volume and market share to the retailers in channel #1 due to inventory holdings of retailers in channel #1.

These market shares are region-wide market shares and not channel-based market shares. That is, these market shares are the relative sales volume across all channels in a region. You may wish to calculate your own channel-specific market shares, if you are interested in your market share only within a specific channel.

Channel #1 ("Retail") results reflect final end-user customer activity. Thus, the prices reported are the prices paid by final end-user customers. These prices include the retailers' markups on the manufacturers' prices.

Research Study #20: Customer Satisfaction

Purpose: This research study provides customer satisfaction estimates of all products in all channels and in all regions for the last four quarters.

Sample Output

| RESEARCH STUDY #20 (Customer Satisfaction) | | | | |
|--|------------|------------|------------|------------|
| | Quarter 33 | Quarter 34 | Quarter 35 | Quarter 36 |
| REGION 1 | | | | |
| CHANNEL 1: | | | | |
| Product 1-1H | 23.0 | 18.8 | 27.2 | 25.8 |
| Product 3-1H | 16.0 | 22.8 | 26.8 | 23.4 |
| Product 4-2H | 25.2 | 27.2 | 29.3 | 20.0 |
| Product 5-1H | 31.5 | 29.5 | 29.9 | 21.9 |
| ... | | | | |
| CHANNEL 2: | | | | |
| Product 1-2H | 28.5 | 38.8 | 26.9 | 22.4 |
| Product 2-1H | 22.9 | 28.7 | 23.5 | 23.8 |
| ... | | | | |

Information Source: Customer satisfaction is based on a customer survey of current users. Customer satisfaction is the percentage of survey respondents rating their overall satisfaction with a product as "excellent" on a 4-point "poor"-“fair”-“good”-“excellent" rating scale.

Cost: \$10,000.

Research Study #23: Concept Test

"The final question needed to come to grips with the business purpose and business mission is: 'What is value to the customer?' It may be the most important question. Yet it is the one least often asked. One reason is that managers are quite sure that they know the answer. Value is what they, in their business, define as quality. But this is almost always the wrong definition. The customer never buys a product. By definition, the customer buys the satisfaction of a want. He buys value. What a company's different customers consider value is so complicated that it can be answered only by the customers themselves. Management should not even try to guess at the answers. It should always go to the customers in a systematic quest for them." – Peter Drucker

Purpose: This research study provides concept test scores for a range of set-top box configurations "around" a specified configuration in a specified region.

Information Source: This research study is based on end-user customer surveys.

Study Details: These concept test scores are "top-box" scores. They represent the percentage of end-user customers surveyed assessing the hypothetical set-top box concept as being "excellent" on a 4-point "poor"-“fair”-“good”-“excellent" rating scale.

Sample Output

| RESEARCH STUDY #23 (Concept Test) | | | | | | | |
|---|------|--------|------|--------|------|--------|------|
| Product 1-1 Current Configuration [Region 1, Channel 1] | | | | | | | |
| H99632 | 1.9% | H88522 | 2.1% | H88531 | 2.5% | H88532 | 3.1% |
| H88521 | 1.9% | H88522 | 2.1% | H88531 | 2.5% | H88532 | 3.1% |
| H88621 | 2.3% | H88622 | 2.9% | H88631 | 3.7% | H88632 | 3.7% |
| H89521 | 1.9% | H89522 | 1.9% | H89531 | 2.4% | H89532 | 2.6% |
| H89621 | 2.3% | H89622 | 2.4% | H89631 | 3.2% | H89632 | 3.0% |
| ... | | | | | | | |

Concept test scan searches are conducted "around" the specified configuration. Here, "around" means that 243 concept tests are executed (subject to prevailing set-top box technology limits), one for each of the set-top box configuration attributes that are tested in concept tests

(alpha, beta, bandwidth, warranty, and packaging), varying the values up and down one from the specified configuration for each attribute. **Concept test scores are reported for scanned concepts whose scores exceed that of the designated configuration by at least 1%.**

As shown in the sample output, the concept test score for the specified configuration is reported, along with all of the results for the concept test scanning search around that specified configuration. Only those scanned concept scores exceeding the specified configuration by at least 1% are reported. In this sample output, the configuration H99632 is apparently a rather unattractive configuration in market region 1, thus accounting for the generally low concept test scores for the specified configuration and for all of its scanned variants.

Cost: \$15,000 per concept test per channel per region for up to four concept tests in a quarter. Concept tests beyond four in a quarter cost double the standard cost of \$15,000 (per concept test per channel per region).

Limitations: A maximum of eight (8) research studies of this type may be executed each quarter. Each of these research study requests must reference a specific channel and region; this research study cannot be executed for "all" channels or "all" regions, but only for a single channel-region combination. **Concept test scans ordered for all channels (channel "0") or all regions (region "0") will not be executed.**

Additional Information: You need baseline concept test scores to interpret concept test scores. A concept test score of 40% is interesting, but there is no way to tell if that score is associated with a configuration that offers competitive advantage unless you have corresponding concept test scores for existing products that are already on the market. Current configurations or the configurations of leading products are obvious baselines. Of course, you would have to execute concept tests on such baseline configurations (in addition to the hypothetical concepts of interest) if you want access to such baseline-configuration concept test scores.

Research Study #24: Price Sensitivity Analysis

"Any sufficiently advanced technology is indistinguishable from magic." – Arthur C. Clarke

Purpose: This research study provides a price sensitivity analysis for a specific product in a specific region (or all regions) and a specific channel (or all channels). This research study permits the simultaneous testing of a reconfiguration of an existing, actively-distributed product and an associated price level of the user's choosing. Thus, Research Study #24 is a focused test marketing experiment with user-specified configurations and prices.

Information Source: This research study is based on surveys of customers, using advanced marketing research techniques.

Study Details: These price sensitivity analyses isolate the impact of price on market share, while holding other market share drivers constant (product quality, service quality, and availability perceptions).

Nine price levels are used in this research study. With no user-specified price input, these price levels are automatically centered around the current price (the "Reference Price") of the product in each region and channel for which this research study is executed. Values of -20%, -15%, -10%, -5%, 0% (i.e., current price), +5%, +10%, 15%, and +20%, relative to the product's "Reference Price," are used.

If configuration and price are left at their default values ("?...?" and 0, respectively), then Research Study #24 is executed with the existing product centered around the channel-specific

current price of the specified product. Otherwise, the user-specified configurations and prices (with the specified price being the "Reference Price") are used. Market share predictions are provided for all tested prices in Research Study #24.

Research study output includes market share and gross margin estimates in research study requests with no configuration change. With a configuration change, research study output only includes estimated market shares. Users will need to calculate/estimate their own product and other variable costs (and, therefore, gross margin) associated with any configuration change.

These "prices" are the final end-user customer prices (the "market price" to final end-users customers) in each channel, since final customers are the subject of this research study. For an indirect channel (like channel #1), retail prices are used; for a direct channel (like channel #2), the manufacturer sets final prices, so manufacturer prices are used.

Cost: \$20,000 per price sensitivity analysis (per product per region per channel). If you execute this research study for all products, regions, and channels in a 2-product, 3-region, and 2-channel LINKS environment, the total cost would be \$240,000.

Limitations: A maximum of four (4) research studies of this type may be executed each quarter. Each of these price sensitivity analysis research study requests must reference a single product and one or all regions and channels. This research study may only be conducted for products that are already actively distributed in a region and channel. This research study may not be used for products prior to their introduction into a region and/or channel.

Sample Output With No Configuration Change:

```

=====
RESEARCH STUDY #24 (Price Sensitivity Analysis )
=====

PRODUCT 6-1H PREDICTED GROSS MARGINS IN REGION 1, CHANNEL 1 [HYPERWARE]
Configuration: H35322
Reference Price: 290

```

| | | | | | | | | | |
|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Market Price | \$ 351 | \$ 373 | \$ 395 | \$ 417 | \$ 438 | \$ 459 | \$ 481 | \$ 503 | \$ 525 |
| Your Price | \$ 232 | \$ 247 | \$ 261 | \$ 276 | \$ 290 | \$ 304 | \$ 319 | \$ 333 | \$ 348 |
| Your Cost | \$ 171 | \$ 171 | \$ 171 | \$ 171 | \$ 171 | \$ 171 | \$ 171 | \$ 171 | \$ 171 |
| Your Margin | \$ 60 | \$ 75 | \$ 89 | \$ 104 | \$ 118 | \$ 132 | \$ 147 | \$ 161 | \$ 176 |
| Sales Volume | 30,577 | 25,879 | 21,985 | 19,002 | 16,459 | 14,269 | 12,513 | 11,086 | 10,533 |
| Market Share | 9.9% | 8.4% | 7.1% | 6.2% | 5.3% | 4.6% | 4.1% | 3.6% | 3.4% |
| Margin Chang | -49.2% | -36.4% | -24.6% | -11.9% | 0.0% | 11.9% | 24.6% | 36.4% | 49.2% |
| MS Change | 85.8% | 57.2% | 33.6% | 15.4% | 0.0% | -13.3% | -24.0% | -32.6% | -36.0% |
| Net Change | -5.5% | -0.1% | 0.7% | 1.8% | 0.0% | -3.0% | -5.3% | -8.1% | -4.5% |
| Gross Margin (in \$000s) | \$1,834 | \$1,940 | \$1,956 | \$1,976 | \$1,942 | \$1,883 | \$1,839 | \$1,784 | \$1,853 |

These estimated per-unit costs of \$171.09 include these cost components:

| | |
|-------------------------|----------|
| Product Costs | \$155.47 |
| Order Processing Costs | \$ 4.00 |
| Replacement Parts Costs | \$ 11.62 |
| Duties & Tariffs | \$ 0.00 |

Sample Output With A Reconfiguration:

```

=====
RESEARCH STUDY #24 (Price Sensitivity Analysis )
=====

PRODUCT 8-1H PREDICTED GROSS MARGINS IN REGION 1, CHANNEL 1 [HYPERWARE]
Configuration: H11111
Reference Price: 400

```

| | | | | | | | | | |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Market Price | \$480 | \$510 | \$540 | \$570 | \$600 | \$630 | \$660 | \$690 | \$720 |
| Your Price | \$320 | \$340 | \$380 | \$380 | \$400 | \$420 | \$440 | \$460 | \$480 |
| Sales Volume | 6,508 | 4,603 | 4,398 | 2,778 | 3,319 | 2,432 | 2,564 | 2,487 | 1,781 |
| Market Share | 10.1% | 7.2% | 6.8% | 4.3% | 5.2% | 3.8% | 4.0% | 3.9% | 2.8% |

```

This price sensitivity analysis involves a product reconfiguration. Margin
Estimates are not provided due to the many cost-related assumptions required
To estimate variable product costs associated with a reconfigured product.

```

Additional Information: These market share predictions and subsequent estimates of gross margins are based on the assumption that competing products don't change their generate demand programs. Obviously, large price changes will tend to evoke competitive responses.

The reported market shares in Research Study #24 are long-run estimates of market shares if you continue with all of your current customer-facing initiatives (configurations, marketing spending, service levels, etc.) as they are now and so do competitors. Market infrastructure issues (like current inventory holdings of retailers and unfilled order status) are not considered. Only your price is "manipulated" in Research Study #24. Thus, these Research Study #24 estimates of market share will not correspond exactly to your current actual market shares (as reported, for example, in Research Study #14).

Research Study #27: Marketing Program Benchmarking

Purpose: This research study provides marketing program benchmarking information for all active products in all channels of specified regions. You may execute this research study for one region, any combination of regions, or all regions.

Information Source: This research study is based on analyses conducted by your research supplier.

Cost: \$500 per category per channel per region plus \$500 per active product in each category, channel, and region.

Study Details: For each active product in each category in each channel in each specified market region, product-specific marketing program benchmarks are provided: total marketing spending, advertising spending ("Advertis"), promotion spending, sales force spending ("SalesFor"), marketing communications positioning ("Pos"), and promotional program ("Prom Prog").

Sample Output

```

=====
RESEARCH STUDY #27 (Marketing Program Benchmarking )
=====

Marketing Program Spending
Marketing Spending Advertis Promotion SalesFor Pos Prom
-----
REGION 1
Ch#1: 1-1 100,000 34,000 33,000 33,000 37 12
      1-2 150,000 70,000 60,000 20,000 12 40
Ch#2: 1-1 100,000 34,000 33,000 33,000 37 49
      2-1 100,000 34,000 33,000 33,000 37 49
      3-1 100,000 34,000 33,000 33,000 37 49
...

```

Research Study #28: Marketing Program Experiment

*"I know that half of my marketing budget is wasted,
but I just don't know which half." - Unknown*

Purpose: This research study conducts a marketing program experiment. Inputs include a full marketing program (marketing spending, marketing mix allocation, positioning, and promotional program) for a product in one or all regions and channels. Outputs include customer perceptions of product quality, service quality, and availability.

Information Source: This marketing program experiment is executed in a small but representative part of the specified market region and channel. This marketing program experiment is executed using your specified marketing program and all other current marketing mix variables of your product and all competitors' products. Your competitors will not be aware of the existence of this marketing program experiment and they have no opportunity to intervene to attempt to influence the results of this experiment. Competitors' marketing decision variables are held constant at their values in the previous quarter.

Cost: \$12,500 per marketing program experiment.

Sample Output:

| ===== | | | | | | | | | | | | |
|---|--------------------------|---|--------|--------|------|------|------|----|----|-------------|-------|-------|
| RESEARCH STUDY #28 (Marketing Program Experiment) | | | | | | | | | | | | |
| ===== | | | | | | | | | | | | |
| | Marketing Program Inputs | | | | | | | | | Perceptions | | |
| | R | C | MktgSp | MktgMx | Adve | Prom | SFor | MP | PP | ProdQ | ServQ | Avail |
| Product 4-1 | 2 | 2 | 200K | 502525 | 100K | 50K | 50K | 73 | 14 | 27.1% | 20.1% | 23.5% |
| Product 4-1 | 2 | 2 | 100K | 343333 | 34K | 33K | 33K | 12 | 20 | 34.2% | 15.9% | 25.1% |
| Product 4-1 | 2 | 2 | 150K | 202060 | 30K | 30K | 90K | 37 | 54 | 14.3% | 18.3% | 43.9% |
| Product 4-2 | 3 | 1 | 100K | 343333 | 34K | 33K | 33K | 37 | 94 | 14.0% | 56.5% | 42.9% |

Notes:

- (1) In the heading, "R" refers to region, "C" refers to channel, "MktgSp" refers to total marketing spending (in L\$000s), "MktgMx" refers to marketing mix allocation (2-digit %s of total marketing spending allocated to advertising, promotion, and sales force), "Adve" refers to implied advertising spending (in L\$000s), "Prom" refers to implied promotion spending (in L\$000s), "SFor" refers to implied sales force spending (in L\$000s), "MP" refers to marketing positioning, and "PP" refers to promotional program.
- (2) This research study may only be executed for products already actively distributed in a region and channel. Blank results are reported for perceptions for products not actively distributed.

Execution Details: To specify "all" regions or channels within a single marketing program experiment, enter "0" (zero) as the region/channel selection. This, of course, would involve multiple executions of marketing program experiments with consequent cost implications. Marketing program experiments must be executed for a specific product. If you wish to execute multiple marketing program experiments, you must specify them separately for each product.

Research Study #28 (Marketing Program Experiment) automatically includes three

experiments for each RS#28 input set. Research Study #28 includes experiments with the specified marketing spending input plus additional experiments with 50% more and 50% less than the specified marketing spending input. These three experiments are included at the standard cost of Research Study #28.

Limitations: A maximum of seven (7) marketing program experiments may be conducted in any quarter. Each marketing program experiment may reference one or all regions and channels.

Other Comments: Marketing program experiments permit an assessment of the impact of marketing spending, marketing mix allocation, positioning, and promotional program on key perceptual outputs (product quality perceptions, service quality perceptions, and availability perceptions). Although not a final outcome measure like market share, sales volume, or profitability, customer perceptions have the advantage of being the direct consequences of a product's marketing program. Final outcome measures like market share, sales volume, and profitability are influenced by many forces, not just a product's marketing program.

Benchmarks are needed to assess the perceptual results in marketing experiments. You can create your own benchmark by testing the marketing program along with variations of interest. While such benchmarking requires the execution of a base marketing experiment (with current marketing spending, marketing mix allocation, positioning, and promotional program) in addition to the test variations of interest, such benchmarking provides the standard against which marketing program variations may be compared.

Marketing experiments have some randomness inherent in their results. This implies that you would only change your marketing program (marketing spending, marketing mix allocation, positioning, and promotional program) if a particular marketing program variation yielded a noteworthy change in customer perceptions.

Research Study #31: Self-Reported Preferences

Purpose: This research study provides self-reported importance weights for a variety of generate demand elements for each market region. In addition, self-reported attribute preferences for various levels of raw materials alpha and beta are provided for each market region.

Information Source: This research study is based on end-user customer surveys.

Study Details:

These self-reported importance weights are the averages across all survey respondents. Seven-point rating scales are used in this end-user customer surveying, where "1" is anchored by "Not Important" and "7" is anchored by "Very Important."

The self-reported attribute preferences reflect the distribution of customers' self-reported preferences across the range of 0-9 kg. for raw materials alpha and beta.

Cost: \$20,000.

Other Comments: Self-reported importance weights are easy things to ask survey respondents. There is, however, considerable debate about the usefulness of such measures. Customers may have trouble distinguishing low-importance and high-importance elements. Customers may report that everything is important, failing to provide the differentiation that is of interest to marketing managers. It's also not clear how to use self-reported importance weights to predict future buying

behavior, since self-reported importance weights aren't developed from actual behavior. Perhaps they're only meant to be directional in nature, identifying only really low and really high importance factors.

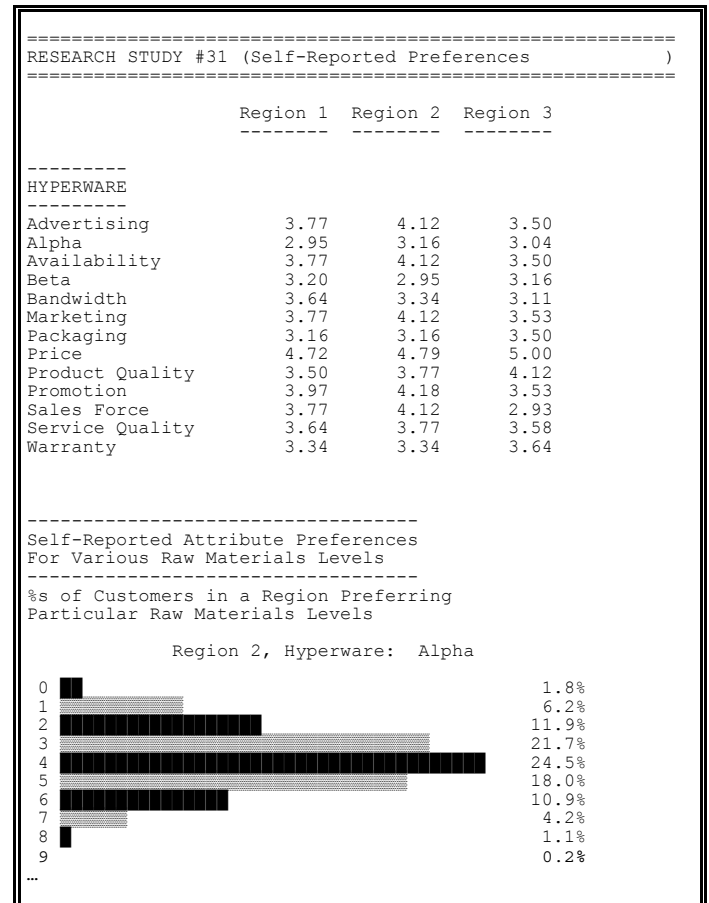
Self-reported importance weights and self-reported attribute preferences are of uncertain quality. It's easy for customers to report "what they want" on such survey instruments, but the statistical veracity of these self-reported weights and self-reported attribute preferences has been questioned by many professional marketing researchers.

Additional Information: In this research study, self-reported attribute preferences are reported only for alpha and beta and not for bandwidth, warranty, and packaging. Bandwidth, warranty, and packaging are "more-is-better" product attributes. There's no doubt as to the "best" (most preferred) level of each of these product attributes. Rational end-user customers should naturally always prefer the highest possible level of bandwidth, warranty, and packaging.

These self-reported attribute preferences represent one approach to assessing customer preferences for specific possible alpha and beta levels in set-top box configurations. These self-reported attribute preferences provide a general scan of customer preferences across the full range of set-top box technology for raw materials alpha and beta. Based on these results, other research studies should be executed to refine reconfiguration options and possibilities. For example, after reviewing the results of this research study, one or more research study #23 ("Concept Test") reports might be executed.

Relatively sharp preference distributions for alpha and beta are indicative of homogeneous customers (who all want about the same raw material level) or strong preferences (they are quite insistent about their requirements for raw materials). Relatively flat preference distributions for raw materials signal heterogeneous customers (there is wide variation in customer preferences for raw material levels) or weak preferences (they are tolerant to variations in raw materials).

Sample Output



Research Studies Table of Contents

Research studies are output in numerical order so you always know the general location of any research study in your output (e.g., lower numbered research studies are printed closer to the front of your research studies output). However, since the research studies ordered vary through time and the space required for research studies also varies, the specific page number of any particular research study is not precisely known ahead of time. For your convenience, a Research Studies Table of Contents is included as the last page of your research studies output.

Financial Reports

"In a good wind, even turkeys can fly." – Chinese saying

At the end of this section, you find samples of the LINKS financial reports. These are the standard reports that you receive after each LINKS quarter. You'll receive the results of any research studies that you order as additional pages, after the last page of your financial results.



In the LINKS Marketing Principles Simulation, you assume managerial control of your firm at the end of quarter 3. All firms started at quarter 1 identically (same products, configurations, prices, marketing spending levels, capital structure, etc.). Since there is no randomness in the simulation in quarter 1, all firms are identical when LINKS begins. This starting position obviously facilitates evaluation, since all firms start at the same place. However, with the introduction of randomness in quarters 2 and 3, there will be minor differences in firms' market shares, sales, gross margins, income, etc. at the end of quarter 3. However, there have been no changes in firms' decisions through quarters 1-3.

To provide an overall roadmap for thinking about the drivers of profitability in LINKS, the charts in Exhibits 1 and 2 decompose net income into its underlying components. In Exhibit 1, the principal drivers of net income are revenues and costs. Taxes and non-operating income play lesser roles. Exhibit 2 provides a breakdown of the drivers of volume, one of the two key drivers of revenues. Collectively, these exhibits provide a sense of the DNA of net income in LINKS.

The "Corporate P&L Statement" aggregates product-specific profit-and-loss statements into an overall corporate P&L statement. Some line-items appear on the "Corporate P&L Statement" only, because it isn't possible to unambiguously allocate those costs to specific products in specific regions. Definitions of non-obvious line-items on the "Corporate P&L Statement" follow:

- Administrative overhead ("Administrative O/H") is \$300,000 per quarter per product per channel per region. Recall that forecasting accuracy influences administrative overhead.
- "Consulting Fees" are positive or negative adjustments to income or expenses. Conversations with your instructor/coach are without charge, so don't worry about "Consulting Fees" associated with these consultations. In LINKS, the "Consulting Fees" line item represents a convenient mechanism for making adjustments to income or expenses.
- Corporate overhead ("Corporate O/H") is \$750,000 per product per quarter. This per-product charge is incurred if a product is actively distributed in one or more regions.
- "Duties & Tariffs" are a percentage of the average selling price for finished goods that are imported into any region. If a firm has a manufacturing plant in a region, there are no duties and tariffs payable. The current duties and tariffs rates are 0%, 8%, and 12%, respectively, for regions 1, 2, and 3. By definition, all finished goods sold in market region 1 are "local," since your firm's manufacturing plant is located in market region 1. "Duties & Tariffs" are levied on sales in a market region (orders from customers).
- "Information Technology" records all IT charges including a \$1,000/page charge for all financial/operating reports plus research studies. This charge is per-firm and is not related to the number of team members. Each quarter's charge is based on the previous quarter's actual page counts.

Exhibit 1: Net Income Drivers in LINKS

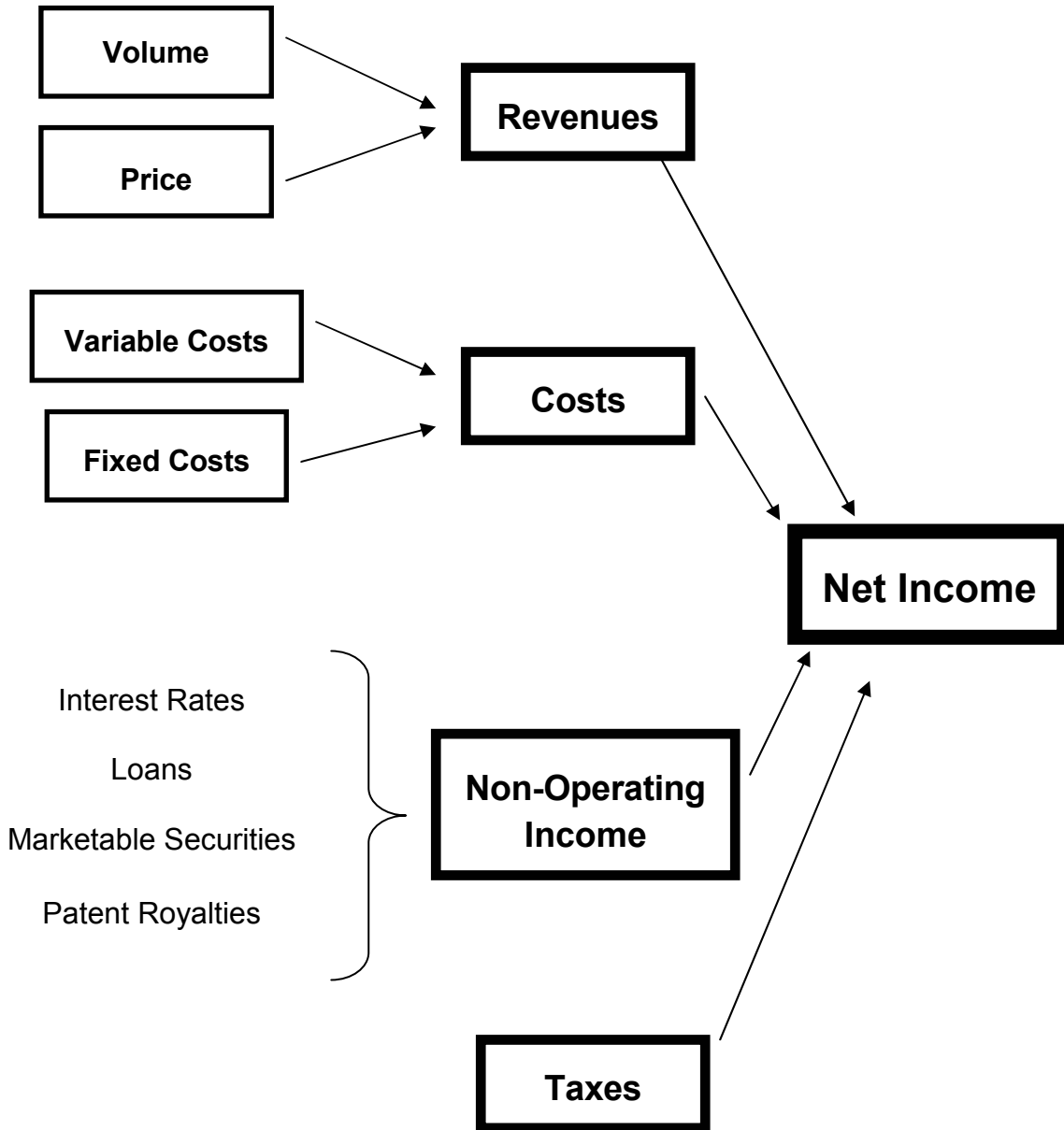
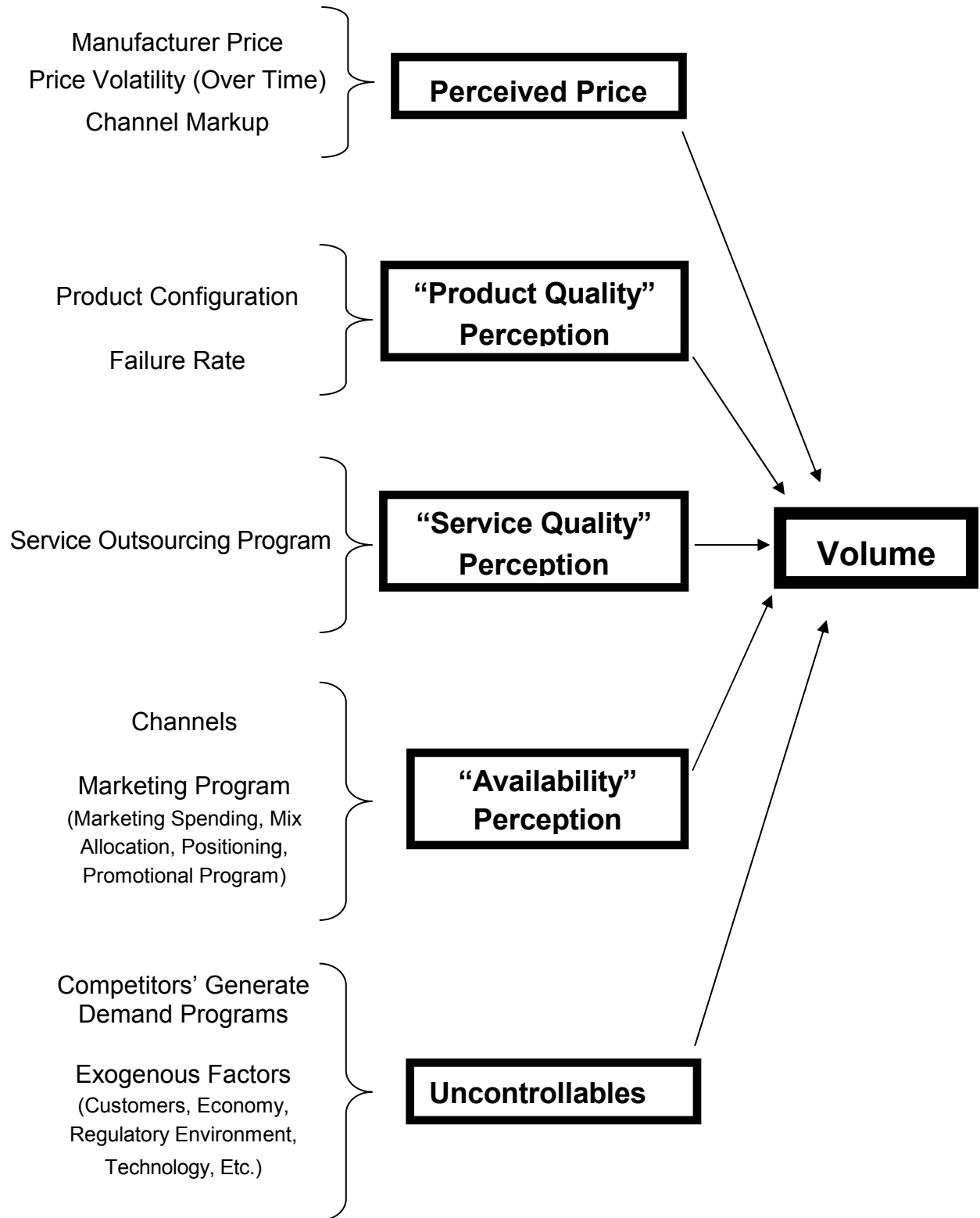


Exhibit 2: Volume Drivers in LINKS

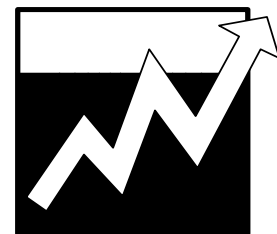


- "Non-Operating Income" derives either from interest earned on "Marketable Securities" or from interest paid on "Loans" from the previous quarter's "Balance Sheet."
- "Patent Royalties" include patent royalties that your firm pays to other firms, as well as patent royalties received from other firms.
- "Research Studies" reflects the total costs associated with last quarter's research study requests. The current quarter's research studies are executed after the current quarter's financial reports are prepared so research study billings are lagged a quarter.
- "Taxes" represents the corporate taxes payable in the market region in which your firm has its manufacturing plant. Your manufacturing plant is located in market region 1, which has a corporate tax rate of 50%.
- "Total Fixed Costs" is the sum of all fixed costs. "Total Fixed Costs" does not sum correctly down and across since some fixed costs aren't allocated to specific products.

On the "Balance Sheet":

- "Cash" represents your cash balance. Cash in excess of 10% of revenues is automatically invested in short-term "Marketable Securities" which earn 1.5% per quarter in "Non-Operating Income" on the "Corporate P&L Statement" in the following quarter. If cash falls below 5% of revenues, a loan is automatically arranged to increase cash to 5% of revenues. You pay interest of 3% per quarter on "Loans" and this interest payment is recorded as "Non-Operating Income" (a negative value of "Non-Operating Income") in the following quarter's "Corporate P&L Statement."
- "Corporate Capitalization" is the dollar-value of the original capital invested by your shareholders to start your firm.
- "Dividends" are cash payments to shareholders. In any quarter in which "Net Income" is positive, 30% of the "Net Income" is allocated to "Dividends."
- "Plant Investment" represents the dollar-value of your firm's investment in a manufacturing plant to produce set-top box products. The normal per-unit production charges that you pay for producing set-top boxes includes a component to cover the maintenance and depreciation of your plant. Thus, your "Plant Investment" value will also be the same through time.

The "Forecasting Accuracy Report" provides details of the forecasting accuracy associated with your forecasts. Recall that sales volume forecasting accuracy also influences the "Administrative O/H" cost for each of your products in each region. In addition, the sales history for all of your firm's products (product-unit sales by product, channel, and region) for the last six quarters is displayed at the end of this report.



The "Set-Top Box Industry Bulletin" provides current-quarter industry-related information. Information reported in the "Bulletin" includes things that an actual manager in the set-top box industry could easily observe without additional cost or with nominal effort during the course of events that comprise a normal quarter's work.

The following pages provide samples of the standard LINKS financial and operating reports. In addition to these reports, you'll receive the results of any research studies that you order on additional pages after the last page of your financial and operating reports. These samples are provided to familiarize you with the style and format of the reports that are provided to your firm after each LINKS round. The data reported in these sample reports are only illustrative of reports formatting. Please do not interpret these samples as suggested guidelines or benchmarks for good decisions and performance within LINKS.

| | Firm 6 | Industry Average | Industry Best |
|-----------------------------------|--------|------------------|---------------|
| FINANCIAL | | | |
| Net Income to Revenues | 5.9% | 5.9% | 6.3% |
| Change in Net Income to Revenues | -0.5% | -0.2% | 0.5% |
| OPERATIONAL | | | |
| Forecasting Accuracy | 84.3% | 83.3% | 86.3% |
| (Marketing + Service) to Revenues | 9.2% | 9.2% | 8.8% |
| CUSTOMER | | | |
| Change in Market Share | -0.5% | 0.0% | 0.8% |
| Customer Satisfaction | 7.8% | 7.8% | 8.3% |

For Your Information

You receive the LINKS scorecard (shown above) automatically each quarter as the first page of your financial and operating reports. This scorecard provides comparatives to assess how your firm's performance compares to the industry averages and industry bests on every Key Performance Indicator (KPI).

Historical plots of all KPIs are provided in your firm's supplementary results Excel spreadsheet ("KPIcharts" worksheet), accessible within the LINKS Simulation Database on the LINKS website. Data from the past six quarters are displayed, to the extent available in your industry's historical archives, to create quarter-by-quarter plots for each of the LINKS performance evaluation metrics (KPIs) compared to the relevant quarter-specific industry best, industry average, and industry worst for your LINKS industry.

| | All Products | Product 6-1 | Product 6-2 |
|------------------------|--------------|-------------|-------------|
| | ----- | ----- | ----- |
| Sales Volume | 102,197 | 86,478 | 15,719 |
| Price | 350 | 330 | 459 |
| Revenues | 35,820,280 | 28,590,680 | 7,229,600 |
| - Product Costs | 13,902,308 | 10,247,641 | 3,654,667 |
| - Order Processing | 1,240,128 | 1,083,052 | 157,076 |
| - Replacement Parts | 106,100 | 0 | 106,100 |
| - Transportation Costs | 2,736,954 | | |
| - Duties & Tariffs | 1,867,350 | 1,867,350 | 0 |
| | ----- | ----- | ----- |
| Gross Margin | 15,967,440 | 15,392,637 | 3,311,757 |
| Fixed & Other Costs: | | | |
| Administrative O/H | 3,050,288 | 2,417,844 | 632,444 |
| Consulting Fees | 0 | | |
| Corporate O/H | 1,500,000 | | |
| Information Technology | 12,000 | | |
| Introductions | 0 | | |
| Marketing | 2,660,000 | 1,940,000 | 720,000 |
| Marketing Creative | 0 | 0 | 0 |
| Price Changes | 0 | 0 | 0 |
| Reconfiguration | 0 | | |
| Research Studies | 0 | | |
| Service Outsourcing | 1,192,536 | 891,976 | 300,560 |
| Total Fixed & Other | 8,414,824 | 5,249,820 | 1,653,004 |
| | ----- | ----- | ----- |
| Operating Income | 7,552,616 | 10,142,817 | 1,658,753 |
| | ----- | ----- | ----- |
| Non-Operating Income | 157,762 | | |
| Patent Royalties | 0 | | |
| Taxes | -3,855,189 | | |
| | ===== | | |
| Net Income | 3,855,189 | | |
| | ===== | | |

| | Previous (Quarter 16) | | Current (Quarter 17) | |
|------------------------|-----------------------|--------|----------------------|--------|
| | ----- | | ----- | |
| Sales Volume | 103,303 | | 102,197 | |
| Price | 359 | | 350 | |
| Revenues | 37,123,360 | 100.0% | 35,820,280 | 100.0% |
| - Product Costs | 14,373,659 | 38.7% | 13,902,308 | 38.8% |
| - Order Processing | 1,284,352 | 3.5% | 1,240,128 | 3.5% |
| - Replacement Parts | 105,914 | 0.3% | 106,100 | 0.3% |
| - Transportation Costs | 2,892,654 | 7.8% | 2,736,954 | 7.6% |
| - Duties & Tariffs | 2,051,246 | 5.5% | 1,867,350 | 5.2% |
| | ----- | | ----- | |
| Gross Margin | 16,415,535 | 44.2% | 15,967,440 | 44.6% |
| Fixed & Other Costs: | | | | |
| Administrative O/H | 3,078,305 | 8.3% | 3,050,288 | 8.5% |
| Consulting Fees | -300,000 | -0.8% | 0 | 0.0% |
| Corporate O/H | 1,500,000 | 4.0% | 1,500,000 | 4.2% |
| Information Technology | 12,000 | 0.0% | 12,000 | 0.0% |
| Introductions | 0 | 0.0% | 0 | 0.0% |
| Marketing | 2,660,000 | 7.2% | 2,660,000 | 7.4% |
| Marketing Creative | 0 | 0.0% | 0 | 0.0% |
| Price Changes | 0 | 0.0% | 0 | 0.0% |
| Reconfiguration | 0 | 0.0% | 0 | 0.0% |
| Research Studies | 0 | 0.0% | 0 | 0.0% |
| Service Outsourcing | 1,182,692 | 3.2% | 1,192,536 | 3.3% |
| Total Fixed & Other | 8,132,997 | 21.9% | 8,414,824 | 23.5% |
| | ----- | | ----- | |
| Operating Income | 8,282,538 | 22.3% | 7,552,616 | 21.1% |
| | ----- | | ----- | |
| Non-Operating Income | 120,220 | 0.3% | 157,762 | 0.4% |
| Patent Royalties | 0 | 0.0% | 0 | 0.0% |
| Taxes | -4,201,379 | -11.3% | -3,855,189 | -10.8% |
| | ===== | | ===== | |
| Net Income | 4,201,379 | 11.3% | 3,855,189 | 10.8% |
| | ===== | | ===== | |

| | All Regions (TOTAL) | Region 1 (Canada) | Region 2 (Mexico) | Region 3 (Brazil) |
|--------------------------------|-------------------------|-----------------------|-----------------------|-----------------------|
| Active? Ch#1,2 | | Yes Yes | Yes Yes | Yes Yes |
| Sales Volume, Ch#1 | 43,287 | 13,608 | 8,789 | 20,890 |
| Sales Volume, Ch#2 | 37,296 | 5,603 | 17,582 | 14,111 |
| Price, Ch#1,2 | 275 400 | 275 400 | 275 400 | 275 400 |
| Revenues | 26,822,325 | 5,983,400 | 9,449,775 | 11,389,150 |
| - Product Costs | 9,549,084 | 2,276,503 | 3,124,963 | 4,147,618 |
| - Order Processing | 1,068,252 | 188,904 | 457,124 | 422,224 |
| - Replacement Parts | 0 | 0 | 0 | 0 |
| - Duties & Tariffs | 2,122,676 | 0 | 755,980 | 1,366,696 |
| Gross Margin | 14,082,313 | 3,517,993 | 5,111,708 | 5,452,612 |
| Fixed Costs: | | | | |
| Administrative O/H | 2,199,161 | 778,581 | 716,788 | 703,792 |
| Marketing, Ch#1 | 1,080,000 | 360,000 | 360,000 | 360,000 |
| Marketing, Ch#2 | 1,080,000 | 360,000 | 360,000 | 360,000 |
| Marketing Creative | 0 | 0 | 0 | 0 |
| Price Changes | 0 | 0 | 0 | 0 |
| Service Outsourcing | 826,204 | 157,470 | 277,668 | 391,066 |
| Total Fixed Costs | 5,185,365 | 1,656,051 | 1,714,456 | 1,814,858 |
| Operating Income | 8,896,948 | 1,861,942 | 3,397,252 | 3,637,754 |
| ===== | | | | |
| Sales Volume Forecast, Ch#1 | | 9,017 | 7,423 | 17,405 |
| Sales Volume Forecast, Ch#2 | | 4,158 | 13,470 | 11,583 |
| Service: Service Outsourcing | | 2 Standard | 2 Standard | 2 Standard |
| Product 6-1 Configuration: | H11101 | | | |
| Marketing Program, Channel #1: | | | | |
| Marketing Spending: | 360,000 | 360,000 | 360,000 | 360,000 |
| Advertising Spending | 144,000 | 144,000 | 144,000 | 144,000 |
| Promotion Spending | 108,000 | 108,000 | 108,000 | 108,000 |
| Sales Force Spending | 108,000 | 108,000 | 108,000 | 108,000 |
| Marketing Mix Allocation | 403030 | 403030 | 403030 | 403030 |
| Positioning | 17 | 17 | 17 | 17 |
| Promotional Program | 49 | 49 | 49 | 49 |
| Marketing Program, Channel #2: | | | | |
| Marketing Spending: | 360,000 | 360,000 | 360,000 | 360,000 |
| Advertising Spending | 144,000 | 144,000 | 144,000 | 144,000 |
| Promotion Spending | 108,000 | 108,000 | 108,000 | 108,000 |
| Sales Force Spending | 108,000 | 108,000 | 108,000 | 108,000 |
| Marketing Mix Allocation | 403030 | 403030 | 403030 | 403030 |
| Positioning | 17 | 17 | 17 | 17 |
| Promotional Program | 49 | 49 | 49 | 49 |

For Your Information

The standard LINKS quarterly reports include separate product P&L statements for each of your products. In this sample display, only a report for product 1 is included.

 FIRM 6: Global Set-Top Box Pty. INDUSTRY MPS
 BALANCE SHEET, QUARTER 17 PAGE 6

ASSETS

 Cash 3,582,028
 Marketable Securities 13,346,449
 Finished Goods Inventory 0
 Plant Investment 100,000,000
 Total Assets 116,928,477

LIABILITIES AND EQUITIES

 Corporate Capitalization 100,000,000
 Dividends, Current Quarter -1,156,556
 Dividends, Cumulative Prior To This Quarter -6,098,501
 Loans 0
 Retained Earnings, Current Quarter 3,855,189
 Retained Earnings, Cumulative Prior To This Quarter 20,328,345
 Total Liabilities and Equities 116,928,477

 FIRM 6: Global Set-Top Box Pty. INDUSTRY MPS
 PRODUCT COST REPORT, QUARTER 17 PAGE 7

| ORIGINAL (PLANT) | Product | Product |
|--------------------|---------|---------|
| MANUFACTURING COST | 6-1 | 6-2 |
| ----- | ----- | ----- |
| Alpha | 3.00 | 15.00 |
| Beta | 4.00 | 20.00 |
| Bandwidth | 10.50 | 72.50 |
| Warranty | 0.00 | 20.00 |
| Packaging | 10.00 | 14.00 |
| Gamma | 17.00 | 17.00 |
| Epsilon | 24.00 | 24.00 |
| Labor Cost | 30.00 | 30.00 |
| Production Cost | 20.00 | 20.00 |
| | ----- | ----- |
| | 118.50 | 232.50 |

 FIRM 6: Global Set-Top Box Pty. INDUSTRY MPS
 TRANSPORTATION COST REPORT, QUARTER 17 PAGE 8

| | | Surface | | Air | | Emergency | | |
|--|---------------------|--------------------------------|--------|------|--------|-----------|---------|------------|
| SUB-ASSEMBLY COMPONENTS | | Cost | Volume | Cost | Volume | Cost | Volume | Total Cost |
| Plant/DC1: | Gamma | 4.00 | 0 | 4.00 | 0 | 4.00 | 110,232 | 440,928 |
| | Epsilon | 6.00 | 0 | 6.00 | 0 | 6.00 | 110,061 | 660,366 |
| CUSTOMER SHIPMENTS | | | | | | | | |
| | Region 1, Channel 1 | (30,065 units @ \$ 4.00/unit) | | | | | | 120,260 |
| | Region 1, Channel 2 | (13,844 units @ \$ 8.00/unit) | | | | | | 110,752 |
| | Region 2, Channel 1 | (8,789 units @ \$18.00/unit) | | | | | | 158,202 |
| | Region 2, Channel 2 | (17,582 units @ \$28.00/unit) | | | | | | 492,296 |
| | Region 3, Channel 1 | (20,890 units @ \$26.00/unit) | | | | | | 543,140 |
| | Region 3, Channel 2 | (14,111 units @ \$36.00/unit) | | | | | | 507,996 |
| REPLACEMENT PARTS SHIPMENTS TO CUSTOMERS | | | | | | | | |
| | Region 1, Channel 1 | (6,612 units @ \$ 2.00/unit) | | | | | | 13,224 |
| | Region 1, Channel 2 | (3,119 units @ \$ 4.00/unit) | | | | | | 12,476 |
| TOTAL TRANSPORTATION COSTS | | | | | | | | 3,059,640 |

 FIRM 6: Global Set-Top Box Pty. INDUSTRY MPS
 SERVICE CENTER OPERATIONS REPORT, QUARTER 17 PAGE 9

| | All Regions | Region 1 | Region 2 | Region 3 |
|---------------|-------------|----------|----------|----------|
| PRODUCT 6-1 | | | | |
| Calls | 74,764 | 28,561 | 16,344 | 29,859 |
| CSR Cost/Call | 11.93 | 16.00 | 12.00 | 8.00 |
| PRODUCT 6-2 | | | | |
| Calls | 18,785 | 18,785 | 0 | 0 |
| CSR Cost/Call | 16.00 | 16.00 | 0.00 | 0.00 |

| | Region | Forecast | Actual | Accuracy |
|------------------------|--------|----------|--------|----------|
| | ----- | ----- | ----- | ----- |
| Product 6-1, Channel 1 | 1 | 16,100 | 32,598 | 49.4% |
| Product 6-1, Channel 1 | 2 | 7,508 | 1,948 | 0.0% |
| Product 6-1, Channel 1 | 3 | 17,690 | 15,075 | 82.7% |
| Product 6-1, Channel 2 | 1 | 6,234 | 6,381 | 97.7% |
| Product 6-1, Channel 2 | 2 | 13,385 | 13,951 | 95.9% |
| Product 6-1, Channel 2 | 3 | 11,298 | 16,525 | 68.4% |
| Product 6-2, Channel 1 | 1 | 11,648 | 11,009 | 94.2% |
| Product 6-2, Channel 2 | 1 | 4,946 | 4,710 | 95.0% |

SUMMARY: For 8 forecasts, average forecasting accuracy is 72.9%

Note: Forecasts count within the calculation of forecasting accuracy only if the "actual" value being forecast is greater than 100 for sales volumes (to not penalize you for "small" forecasts). Otherwise, the relevant values of "forecast" and "actual" are only reported for reference purposes, but such forecasts are not counted for forecasting accuracy scoring. This is the reason why the number of forecasts referenced in "SUMMARY" may be less than the detailed line-by-line reporting of forecasts.

| ----- | Quarter | Quarter | Quarter | Quarter | Quarter | Quarter |
|--------------------|---------|---------|---------|---------|---------|---------|
| SALES HISTORY | 12 | 13 | 14 | 15 | 16 | 17 |
| ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| REGION 1 | | | | | | |
| Product 6-1H, Ch#1 | 19,218 | 14,787 | 18,390 | 18,544 | 22,024 | 32,598 |
| Product 6-1H, Ch#2 | 6,086 | 6,774 | 7,278 | 6,839 | 7,764 | 6,381 |
| Product 6-2H, Ch#1 | 11,911 | 13,453 | 12,143 | 12,640 | 13,161 | 11,009 |
| Product 6-2H, Ch#2 | 5,048 | 5,546 | 4,235 | 4,693 | 5,543 | 4,710 |
| REGION 2 | | | | | | |
| Product 6-1H, Ch#1 | 6,575 | 9,582 | 9,751 | 8,948 | 1,842 | 1,948 |
| Product 6-1H, Ch#2 | 12,563 | 9,767 | 12,174 | 16,354 | 17,423 | 13,951 |
| REGION 3 | | | | | | |
| Product 6-1H, Ch#1 | 24,388 | 5,334 | 30,710 | 13,539 | 22,719 | 15,075 |
| Product 6-1H, Ch#2 | 10,087 | 9,566 | 11,514 | 8,668 | 12,827 | 16,525 |

Welcome to the quarter 17 issue of the Set-Top Box Industry Bulletin.
Notable set-top box industry developments are highlighted in the Bulletin.

INDUSTRY NEWS HEADLINES

Total industry MPS profits were 23,025,919 this quarter.
Firm 5 leads industry MPS in market share (17.8%).
Firm 6 has the second-highest market share in industry MPS (17.6%).

Total industry MPS research study spending was 0 this quarter.

PRODUCT LAUNCHES AND "UNLAUNCHES"

No products were introduced this quarter.
No products were "unlaunched" (dropped) this quarter.

RECONFIGURATIONS

No products were reconfigured this quarter.

Performance Evaluation

"If you're riding ahead of the herd, take a look back every now and then to make sure it's still there." – Cowboy philosophy

Profitability measures obviously matter in assessing the long-run performance of a business. However, "other things" are leading indicators of future profitability and root causes of profitability. As you'll note from the details that follow, current performance and change in performance are considered in the LINKS multi-dimensional performance evaluation scorecard.

The LINKS scorecard is perhaps described more aptly as a boardroom-level scorecard. It focuses on top-line boardroom kinds of financial, operational, and customer performance measures and sub-measures. The LINKS scorecard includes the measures and weights described in Exhibits 3-5. Each firm in your set-top box industry submits their raw data to the Set-Top Box Trade Association, which provides your firm's personal scorecard every quarter.

The LINKS scorecard is based on a ranking of performance on each sub-measure. These rank-order comparisons across all competing firms within your industry avoid the undue influence of particularly extreme values of individual sub-measures. This LINKS scorecard is a within-industry performance evaluation system. Comparisons across industries are problematic due to variations in environmental and competitive milieu.

Your firm receives weighted points for each competitor for whom your performance on a sub-measure is better. For example, if your firm's ratio of "Net Profits" to "Revenues" is better than three other firms' ratios, your firm receives 9 points. (Of course, the top-performing firm on "Net Income" to "Revenues" ratio in a 6-firm industry would receive 15 points.) In general, the maximum available points on any sub-measure are $W*(N-1)$ where "W" is the sub-measure's weight and "N" is the number of firms in the industry. Points accumulate each quarter throughout the LINKS exercise.

To avoid an overemphasis on minor quarter-to-quarter variations in the calculation of the ranking of firms on the performance sub-measures in the LINKS scorecard, minor differences in the sub-measures are treated as ties in the calculation of ranking points. The thresholds for differences to be treated as meaningful are listed in Exhibits 3-5 for each sub-measure. For example, differences of 0.2% or less for "Ratio of Net Income to Revenues" are considered to be statistically insignificant, and firms within 0.2% of each other would be treated as being tied. Thus, two firms with ratios of Net Income to Revenues of 4.5% and 4.6% would be treated as being tied in the calculation of ranking position and associated points received in any quarter.

You receive the LINKS scorecard automatically each quarter as the first page of your financial and operating reports. This scorecard provides comparatives to assess how your firm's data compares to the industry averages on every KPI. In addition, historical plots of past performance are provided. Data from the past six quarters are used, to the extent available in your industry's historical archives, to create quarter-by-quarter plots for each of the LINKS performance evaluation metrics. For each metric and quarter, the range of values across all firms in your LINKS industry is shown and your firm's position in these ranges is identified.

Exhibit 3: Scorecard Financial Measures

| Sub-Measures | Weight | Sub-Measure Details |
|---|--------|--|
| Ratio of Net Income to Revenues | 3 | Current profitability is the best overall signal of business performance, hence its high weight. Firms are "tied" if their scores are within 0.2% of each other. |
| Change in Ratio of Net Income to Revenues | 1 | Improvement in profitability is important but less important than current profitability. Firms are "tied" if their scores are within 0.2% of each other. |

Exhibit 4: Scorecard Operational Measures

| Sub-Measures | Weight | Sub-Measure Details |
|---|--------|---|
| Forecasting Accuracy | 2 | Forecasting accuracy is a relatively pure signal of management skill and expertise (in this case, in the area of understanding customers and customer demand generating forces). Firms are "tied" if their scores are within 0.5% of each other. |
| Ratio of (Marketing + Service Spending) to Revenues | -1 | Service spending is service outsourcing costs. Marketing spending is an easy way to boost short-run sales volume without necessarily contributing to long-run profitability. Relative to revenues, spending less in marketing and service is desirable. Firms are "tied" if their scores are within 0.2% of each other. |

Exhibit 5: Scorecard Customer Measures

| Sub-Measures | Weight | Sub-Measure Details |
|------------------------|--------|--|
| Change in Market Share | 1 | Change in market share is an overall measure of customer reaction to the firm's offerings. ("Market share" equals customer purchases in all channels and regions.) Firms are "tied" if their scores are within 0.1% of each other. |
| Customer Satisfaction | 1 | Customer satisfaction is a clear measure of customer performance and a long-run leading indicator of repeat purchasing behavior and customer retention. Average customer satisfaction across all products, channels, and regions is used here. Firms are "tied" if their scores are within 0.5% of each other. |

Notes: Positive "weights" are associated with sub-measures where "more is better" and negative "weights" are associated with sub-measures where "less is better." "Change" measures are based on quarter-to-quarter changes.

Appendix: Web-Based LINKS Access

With web-based LINKS access, there's no software or files to download, upload, or install. Just point your favorite internet/web browser at the LINKS website to interact with LINKS. Select your particular LINKS simulation variant from the main LINKS webpage

<http://www.LINKS-simulations.com>

and then access the LINKS Simulation Database using your firm's case-sensitive passcode. **You'll be e-mailed your LINKS firm's passcode just before your LINKS event begins.**

LINKS uses e-mail to communicate with all participants throughout LINKS events. Your LINKS instructor provides us with all participants' e-mail addresses, grouped into LINKS teams, before your LINKS event begins.

Please ensure that your preferred e-mail software is configured to receive e-mail messages from these e-mail addresses:

LINKS@ChapmanRG.com
Administrator@ChapmanRG.com
Chapman@ChapmanRG.com
LINKS@LINKS-simulations.com
Administrator@LINKS-simulations.com
Chapman@LINKS-simulations.com
LINKS@LINKS-simulations.info

More generally, please ensure that your e-mail software is configured to receive e-mail from e-mail addresses from domains ending with:

@ChapmanRG.com
@LINKS-simulations.com
@LINKS-simulations.info

You may need to consult your personal information technology advisor ("guru") to ensure that your e-mail software is configured appropriately to receive e-mail from the various LINKS-related e-mail addresses.

If these e-mail addresses and domains are inadvertently "black-listed" or labeled as "spam" within your e-mail software, you won't receive the regular LINKS e-mailings throughout your LINKS event.

- You'll receive e-mail messages from LINKS at the time your LINKS industry is initialized and made public to the participants. This initial e-mailing includes firm-specific LINKS passcodes to access the LINKS Simulation Database.
- In addition, you'll receive an e-mail reminder each morning when there's a game run scheduled for later that day.
- Some other useful reminder and informational e-mail messages will be sent to you during your LINKS event.

If you don't receive these e-mail messages, then either your e-mail address is incorrect within the LINKS Simulation Database (contact your instructor to change your e-mail address) or your e-mail software, e-mail management system, or firewall is "blocking" receipt of LINKS e-mail messages.

While the LINKS Simulation Database works with all web browsers, Microsoft's Internet Explorer is recommended. **LINKS website access requires a Java-enabled browser.** Otherwise, Java-applet buttons won't appear in your browser and you'll be unable to access any LINKS resources.

Output Retrieval After a LINKS Round

You'll be advised via e-mail when LINKS game-run results are available for access via the LINKS Simulation Database. Access the LINKS Simulation Database, enter your firm's passcode, and the next screen provides clickable links to access your Word doc and Excel results.

You may print your LINKS results within your web browser or save your Word-doc results file to your PC for later reference and/or printing. When you print a LINKS results file, you may wish to change your printer's properties to print two pages of output per physical page in landscape format (i.e., "2-up" printing format) to save paper, if your printer has "2-up" printing capability.

Inputs For the Next LINKS Round

When you're ready to input decisions for the next LINKS round, access the LINKS Simulation Database and make your input changes.

In each LINKS round, one team member should be the designated "inputter" for all decision changes and research studies orders. This ensures that the inputting responsibility clearly resides with a single identifiable LINKS team member.

While any number of members of a LINKS firm may access the LINKS Simulation Database simultaneously, only one member at a time can input new decisions. If multiple members of a LINKS firm attempt to make inputs simultaneously, problems can arise; all decision inputs might not be saved successfully on the LINKS server with simultaneous inputs from multiple LINKS firm members. **Any number of 'browsers' may simultaneously page through the LINKS Simulation Database, viewing the current inputs. However, only one member of a LINKS firm at a time can input new decisions.**

You may make some LINKS inputs now and other inputs later. Only your final LINKS inputs at the official input submission deadline for your LINKS industry are included in the next LINKS round.

Hints and Reminders

After inputting decision variable changes on the LINKS decision forms, one team member inputs these changes into the LINKS Simulation Database. Even if you've allocated responsibilities for the overall LINKS management task to specific team members, one team member must be the designated "inputter" in each simulation round. Of course, that designated "inputter" can change from one simulation round to the next. Check your work carefully. Whatever is input will be your team's decision inputs for the next simulation round.

Within the LINKS Simulation Database, current decision values are displayed on the input screens. You only need to make changes. If you're happy with the current value of a decision

input, leave it as it is. All LINKS decision variables are "standing orders" and remain in effect until changed. However, you must input specific instructions each LINKS round for ordering research studies. Otherwise, research studies will be executed only once since "standing orders" don't exist for research studies.

Decision inputs have extensive checking to ensure input integrity, including upper and lower bounds on permissible numeric entries. Invalid entries result in an error message reporting valid minimums and maximums. In addition, there are informative messages routinely reported at the bottom of each web screen. **Execute the "Submit" button after making changes on a LINKS input web screen.** Then, review new reminder, warning, and error messages reported at the bottom of the regenerated web screen after the inputs are processed by the LINKS web server.

"Submit" each webpage's inputs before moving to another input screen in the LINKS Simulation Database. After you "Submit" a webpage's input changes, check for any new reminder, warning, or error messages at the bottom of the refreshed webpage (just above the "Submit" button) before moving on to other webscreens in the LINKS Simulation Database.

Access to the LINKS website requires a Java-enabled web browser. Otherwise, none of the Java-applet buttons will appear on your browser screen and you'll be unable to access any LINKS resources. If necessary, consult your local information technology guru for assistance in enabling Java in your internet browser. Alternatively, use another PC to access the LINKS website, one with a web browser that is already Java-enabled.

FAQ

"If I click the 'Submit' button in the LINKS Simulation Database input screen, are those inputs final?"

"Submit" and other LINKS buttons (at the bottom of any LINKS Simulation Database input screen) save the current decision variables to the LINKS Simulation Database on the LINKS web server. Make any changes desired up to the official input submission deadline for your LINKS industry, including changing inputs that you've previously changed. Input "finality" only occurs at the input submission deadline. The only thing that matters is the final standing of your LINKS decision inputs and research studies orders at the input submission deadline for your LINKS industry.

A specific time deadline will normally exist for each round of LINKS inputs. It's important to be on time! Plan your team's deliberations and your inputting process/timing accordingly.