www.kpa.co.il/strategycourse

Management and Industrial Strategy
אסטרטגיה ניהולית ותעשייתית

פרופ' רון קנת
ד"ר יוסי רענן

Professor Ron Kenett - ron@kpa.co.il
Dr. Yossi Raanan - yossir@kpa.co.il

Part I

© KPA Ltd., 2007

מטרת הקורס

- הבנת חשיבות אסטרטגיה ניהולית ותעשייתית בסביבה עתירת טכנולוגיה להשגת:
  - כושר תחרות
  - התאמה לסביבה משתנה
  - יציאה ממשבר
  - כניסה לשווקים חדשים

© KPA Ltd., 2007

מבנה הקורס

תנאי קדם: אין

שיטת הלימוד:

- הרצאות פרונטליות
- ביצוע פרויקט במסגרת צוות

הרכב הציון:

- עבודת גמר – 60% (40% עבודה, 20% מצגת)
- מבחן סיום – 40% (נדרש ציון עובר לשקלול)

© KPA Ltd., 2007

נושאי הקורס - 1

1. מבואות:

התפתחות תפיסות ניהוליות ומיצוב הטכנולוגיה בתעשייה תוך ניתוח משמעויות המהפכה התעשייתית ומהפכת המידע (סולם האיכות). מבוא לאסטרטגיות הניהוליות העיקריות המיושמות בתעשייה: ניהול איכות, שש סיגמה, מערכות ייצור גמישות, מערכות תוכנה תעשייתיות ומיכון ארגוני.

2. אסטרטגיה עסקית ושיווקית:

מודלים לניתוח אסטרטגי כגון: BCG, מקינזי, ארטור ד. ליטל, בוז אלן, אופציות ריאליות.

3. אסטרטגית שרות:

מערך השירות ותפקידו במחזור חיי המוצר. התמיכה הטכנולוגית הנדרשת במערך השירות. הצגת האסטרטגיות הניהוליות העיקריות בשירותים: שירות מבוזר / מרוכז, מוקדי שרות.

4. אסטרטגית משאבי אנוש:

מודלים למיפוי ארגוני, סקרי עמדות עובדים, מודלים למיפוי משאבי אנוש, הערכת עובדים ממוקדת תהליך.

5. אסטרטגית התפעול והאיכות:

ניהול זמין ושיטות ייצור ארגוניות יפניות. שש סיגמה.

מערכות ייצור גמישות, ייצור ברשתות ועקרונות הניהול הרב - מוצרי בתעשיות עתירות מיכון.

© KPA Ltd., 2007

נושאי הקורס - 2

6. אסטרטגית מו"פ:

חדשנות טכנולוגית תעשייתית, CMMI, ניהול סטארט-אפ, ניהול מו"פ.

7. אסטרטגית מערכות מידע ותקשורת:

אסטרטגית IT. תקשורת לסוגיה והשפעותיה על ההיערכות התעשייתית והשירותית.

8. ניהול השינוי וניהול סיכונים:

מתודולוגית BEST, EKD ו MUSING

9. ניהול שתופי פעולה ומיזוגים:

סוגי שת"פ. מפות שת"פ. כלים לניהול שת"פ ומיזוגים.

10. מפות אסטרטגיות ומערכות בקרה:

לוח שעונים ארגוני, לוח שעונים פרויקטלי.

1

מבוא

1

Definitions

- **Mission**: What business are we in **ייעוד**
- **Vision**: Desired future state of organization **חזון**
- **Values**: Principles to be observed to meet vision **ערכים**

1

Examples

The Ritz-Carlton Hotel Company:
*In 1983, W.B. Johnson Properties set out to create a fist – an American hotel group with products and services designed to **appeal to** and **suit** the demands of both the **prestigious travel consumer** and the **corporate travel** and meeting planner worldwide.*

Fannie Mae:
Position Fannie Mae to excel in business, profits, and customer service by attracting, developing and retaining quality-focused employees who provide world-class transaction processing services.

General Electric:
Be number one or number two in every market we serve.

Examples

Alcoa:
Alcoa aspires to be the best company in the world.

Eastman Chemical:
Be the best international chemical company.

Texas Instruments:
To be the best defence electronics company in the world.

Aetna:
*We will achieve **sustained**, **superior profitability** and **growth** by developing and delivering commercial property/casualty insurance products and services that meet the needs of small businesses.*

© KPA Ltd., 2007

British Broadcasting Corporation (BBC)

We aim to be the world's most **creative** and **trusted** broadcaster and programme maker, seeking to **satisfy** all our audiences in the UK with services that **inform**, **educate** and **entertain** and that enrich their lives in ways that the market alone will not. We aim to be guided by our **public purposes**; to encourage the UK's most **innovative** talents; to act **independently** of all interests; to aspire to the **highest ethical standards**; to offer the **best value for money**; to be **accountable** to our license payers; to endeavour to be the world's **leading international broadcaster**; and **to be the best** - or to learn from the best - in everything we do.

© KPA Ltd., 2007

הארץ — לא מה שחשבת, עיתון לאנשים חושבים

ידיעות אחרונות העיתון של המדינה — להרגיש בבית, העיתון של המדינה

מעריב — עיתון של כולם

הבורסה — עובד בשבילך, עיתון העסקים של ישראל

מי עדן

היינו רוצים
להתחדש תמיד, כמי המעיין
וכמותם **לזרום לעד.**

היינו רוצים
למצוא את **הנתיבים האפשריים**
ולזרום בהם כמי המעיין
ללא חשש **לטעות ולחזור**
ולזרום אל הים הגדול.

היינו רוצים
להקשיב לצורכי הבאים איתנו במגע
להחיות כל מקום שנזרום בו
להביא באשר נפנה, **בענווה ובמקצועיות**
את **מסר המעיין** שאנו שליחיו.

חזון מי עדן

Alcoa Aspires to Be the Best Company in the World

© KPA Ltd., 2007

Eastman Chemical Company

Be the Best International Chemical Company...

© KPA Ltd., 2007

DSBG Dead Sea Bromine Group

No. 1 in Bromine and Bromine Compounds

No. 1 in Soil Fumigation

No. 2 in Fire Retardants

The Dead Sea Bromine Group Strategic Objectives

© KPA Ltd., 2007

TEVA

Our Vision

Teva is a global Israeli based pharmaceutical company. Its vision is to become one of the world's leading pharmaceutical companies, by being the undisputed leader in the global Generics industry and by developing a global franchise in selected Innovative products originating from Israeli science.

Teva differentiates itself by balancing its portfolio with Generic and Innovative activities, by the strategic depth of its vertical integration, by combining local customer responsiveness with a "global edge" and by successfully managing increasing profitable growth and complexity.

Our success lies in the leadership of our management, the skills and devotion of our people, the quality of our offerings and our focus on customers and patients.

© KPA Ltd., 2007

Core Values

Leadership

•Think globally and act locally

•Create value by cross leveraging our global organization's strengths

•Provide leadership in the communities we serve

Always be better than the competition

Strategic Discipline

•See the big picture and use a long term approach

•Deliver results on strategic goals

•Think and act strategically on global and local basis

Operational Excellence

•Do more and better for less, rather than Either-Or

Creativity

•Reward and recognize the implementation of strategic innovation and creative thinking

Openness to Change

•Encourage directness and open communication channels

•Be fast and flexible

•Translate challenges into opportunities

© KPA Ltd., 2007

Strategic Goals

Sustained Profitable Growth

Approximately 20% top-line annual growth through investments in Research and Development and acquisitions.

Sales double every 4 years. Profits double more rapidly.

Proactive cost containment.

Industry & Market Leadership

To become first or second in each significant market to Teva.

A leader in affordable, Generic and selected Innovative pharmaceutical products.

Strong "First to Market" and "Entire Basket" strategies to ensure competitive advantage.

The leader in the globalizing Generics industry.

Globalization

Leverage global strengths in Generic and Innovative activities.

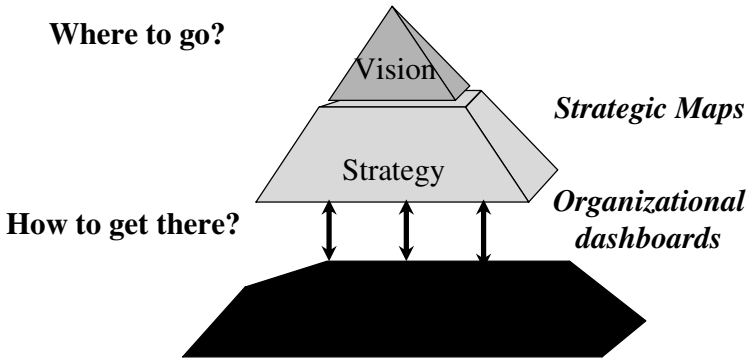
Develop a global franchise for selected Innovative products by leveraging Israeli science.

Take an active role in leading the process of globalization in the Generics industry.

Local responsiveness and accountability combined with global efficiency and effectiveness.

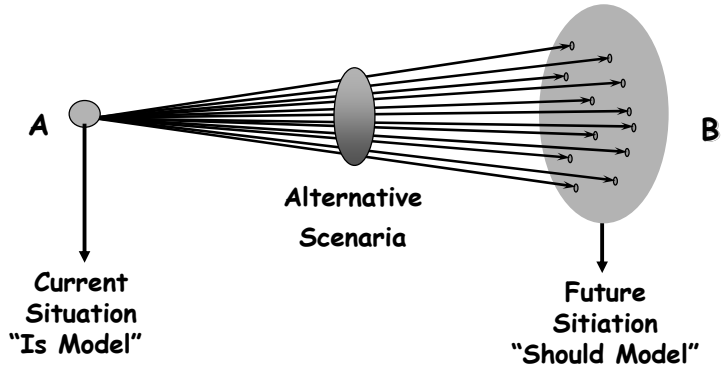
© KPA Ltd., 2007

Strategic Planning



© KPA Ltd., 2007

Strategic Planning



© KPA Ltd., 2007

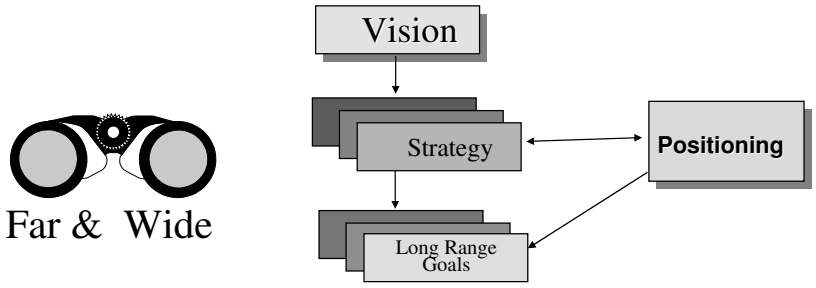
Establish a Vision

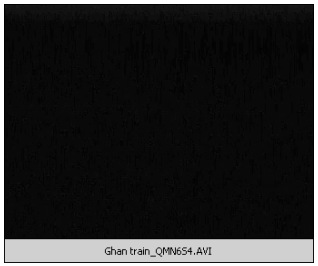
Translate it to Strategic Quality Objectives

Work to Achieve these Objectives

© KPA Ltd., 2007

Far & Wide





© KPA Ltd., 2007


Trends

Markets


Competition


Financial Resources


Customers

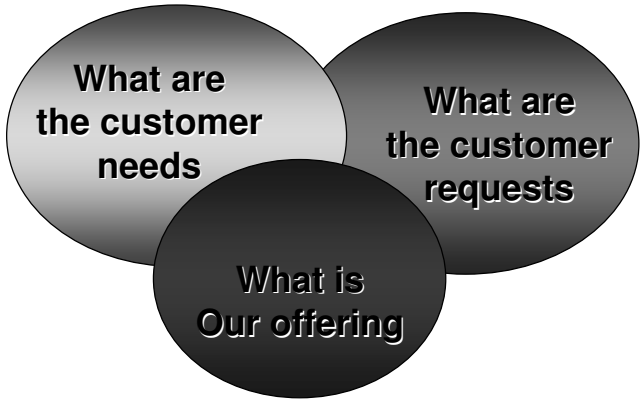

Products & Services


SWOT


Culture

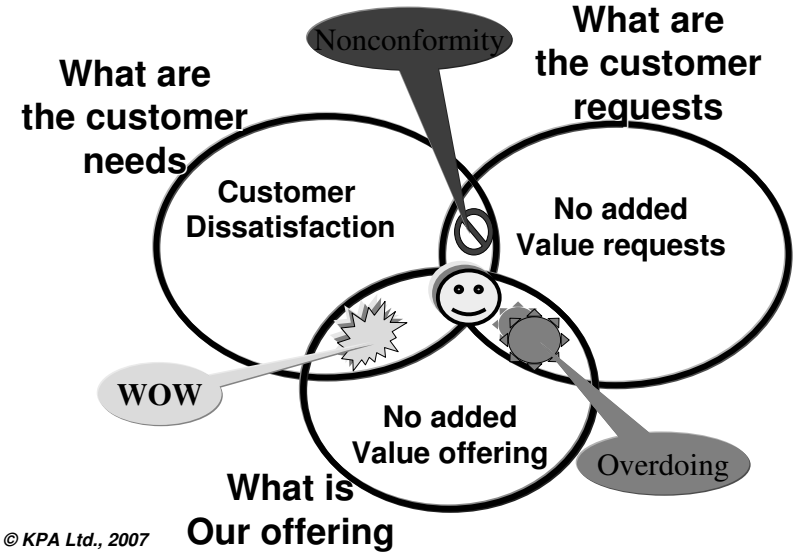
© KPA Ltd., 2007

Three Questions

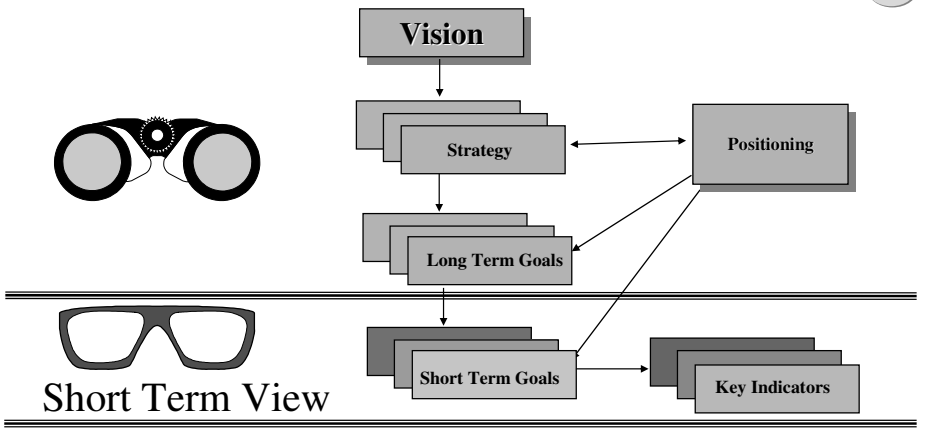


© KPA Ltd., 2007

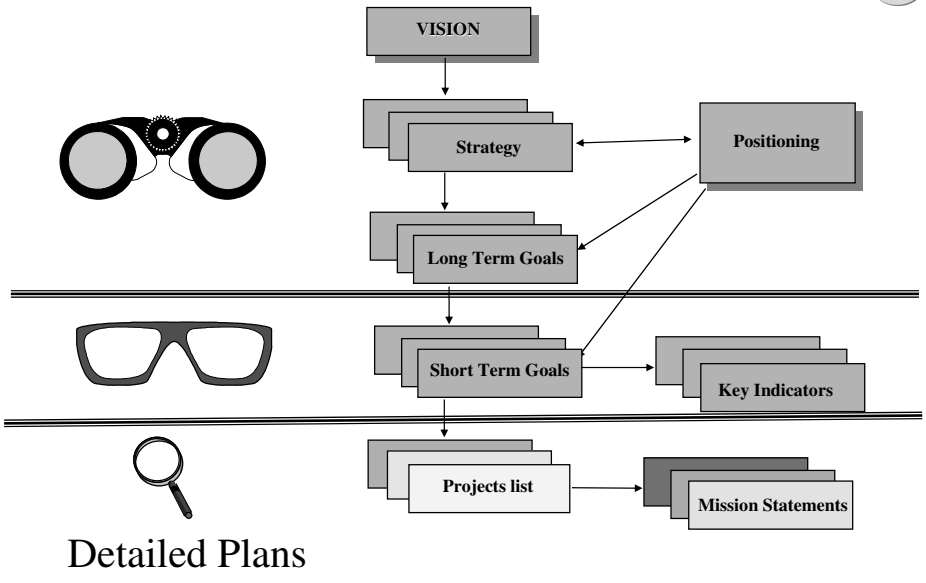
Focus areas



© KPA Ltd., 2007



© KPA Ltd., 2007



© KPA Ltd., 2007

מפעל ההרכבות המוביל בישראל

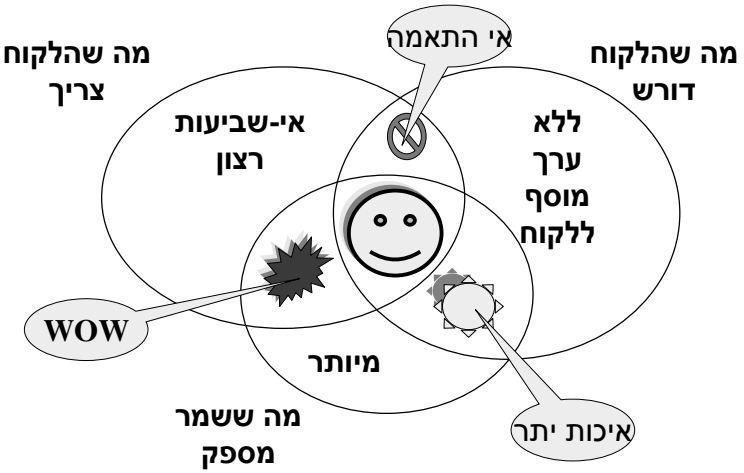
- זמני תגובה קצרים
- משרת את החטיבות בצורה הטובה ביותר
- מוקד רווח
- מצטיין באיכות
- מרכז ידע ברמת מקצועיות גבוהה
- פתרונותTURN KEY

© KPA Ltd., 2007

שלוש זוויות ראייה

© KPA Ltd., 2007

במה להתמקד?



© KPA Ltd., 2007

היקף ומאפייני פעילות נוכחית -1

נתוני תקציב

- $M440 -מכירות
- חומרים+עבודה - $M150
- עלות - $M17
- מכירות - $M13

נתוני כ"א

- 673 עובדים
- 531 עובדים קבועים
- תגמול ברמה פרטנית

© KPA Ltd., 2007

היקף ומאפייני פעילות נוכחית - 2

מע"מ

- מס' שכבות ממוצע - 6
- עלות ממוצעת - $30
- היקף רכש - 10 מיליון$
- השמות לשנה 200 מיליון

הרכבות

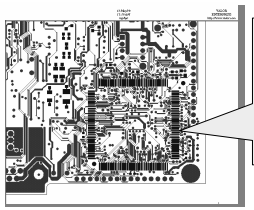
- עלות בין 5 - 40 $
- היקף פעילות - 11 מיליון$
- עלויות ישירות להרכבות כאחוז ממכירות כולל - 3.3%

© KPA Ltd., 2007

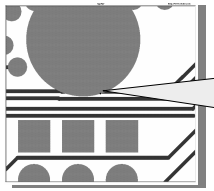
בעיות שהן הזדמנויות

עלות תיקון
ליחידה 1.5$

תחזית יצור של
6000יחידות לחודש



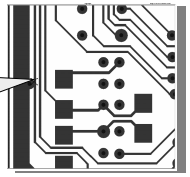
אי-התאמה
לתהליך
בקו הרכבה



Solder Mask
Coverage

אובחן ע"י מערכת Valor

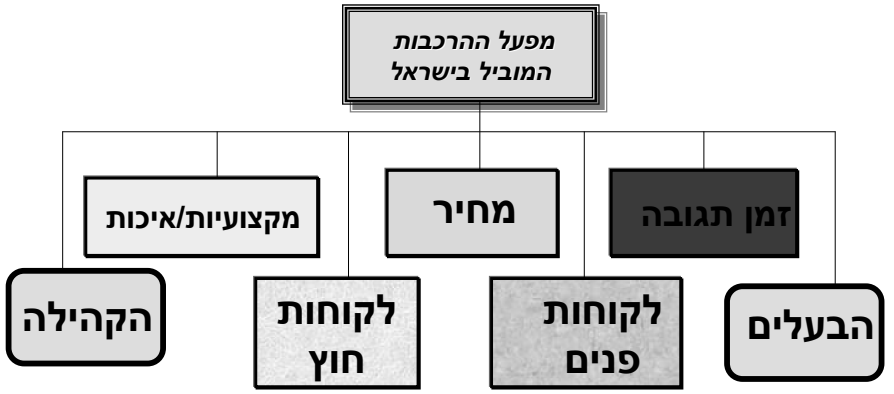
CAD
SHORT



אובחן ע"י מערכת Valor

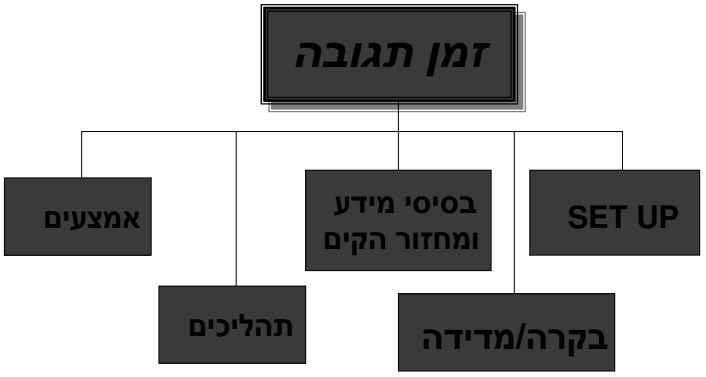
© KPA Ltd., 2007

פריסת מטרות



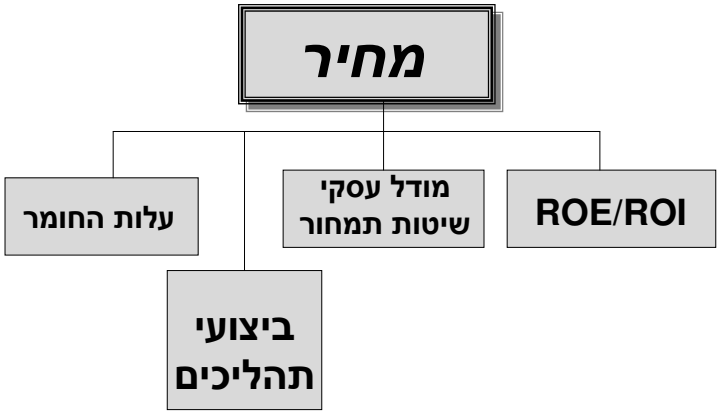
© KPA Ltd., 2007

פריסת מטרות



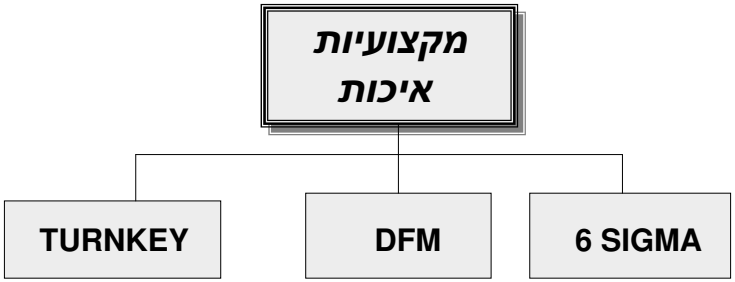
© KPA Ltd., 2007

פריסת מטרות

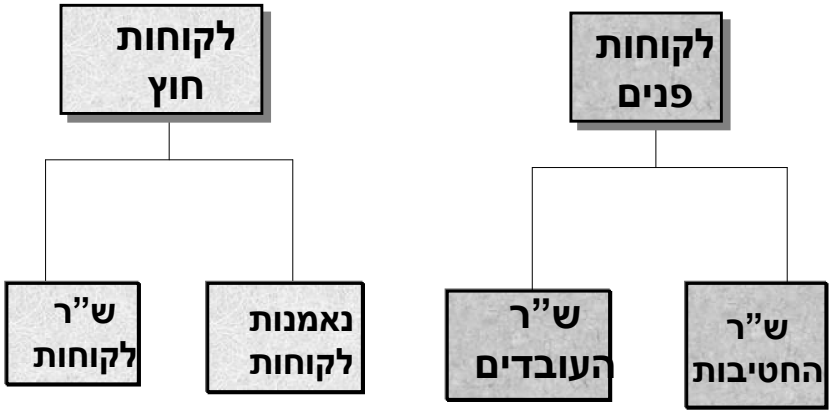


© KPA Ltd., 2007

פריסת מטרות



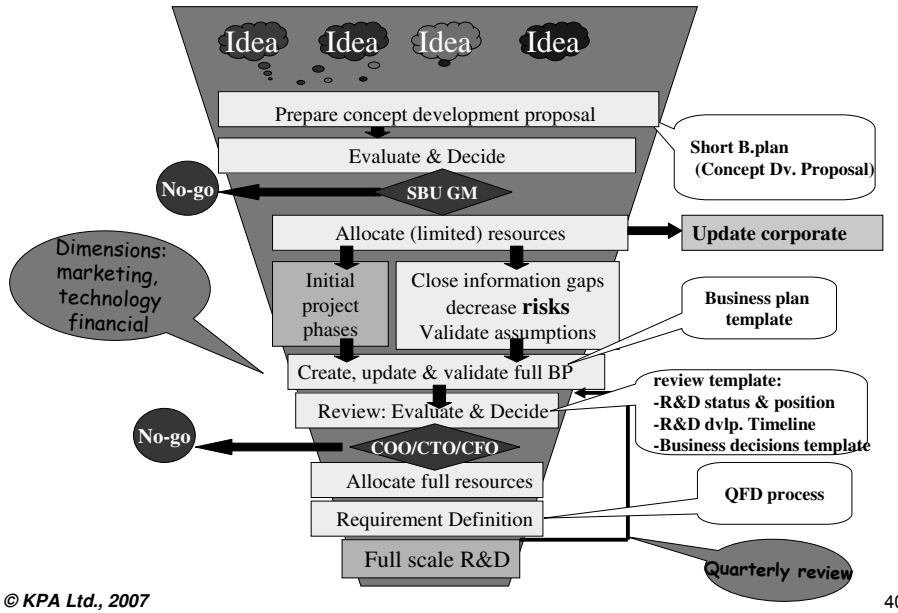
פריסת מטרות



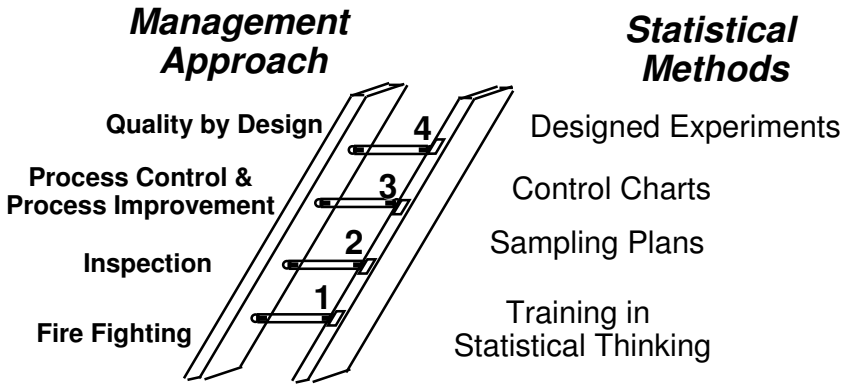
פרקים בתכנית האסטרטגית

- מצב השוק בישראל ובחו"ל
- הטכנולוגיה הנוכחית והעתידית
- דרישות לקוח/הסכמי שותפות
- משאבי אנוש
- איכות
- רכש
- השקעות
- לוגיסטיקה
- מערכות מידע

Opportunities funnel



The Quality Ladder*



How do you handle the inconvenience of customer complaints ?

© KPA Ltd., 2007

*MODERN INDUSTRIAL STATISTICS by Kenett and Zacks, Duxbury, 1998

Six Sigma

© KPA Ltd., 2007

Six Sigma Basics

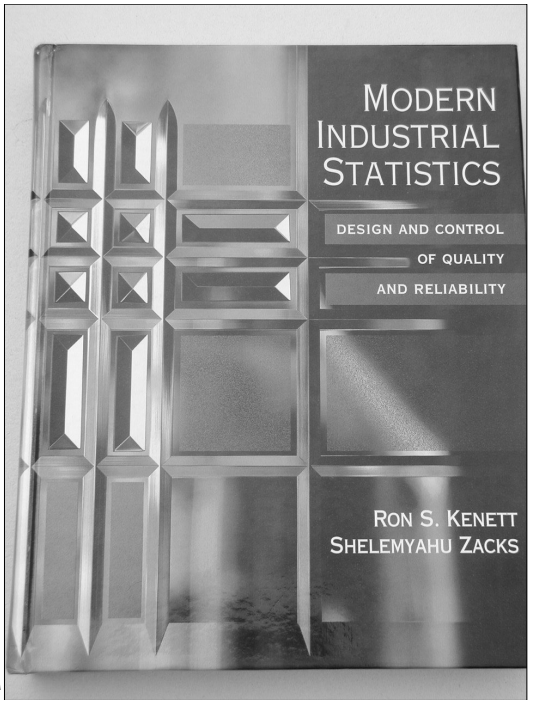
Scientific: "Show me the data"

- Structured approach.
- Assuming quantitative data.

Practical: "Show me the money"

- Emphasis on financial result.
- Start with the voice of the customer.

© KPA Ltd., 2007



MODERN INDUSTRIAL STATISTICS, Kenett and Zacks, Duxbury, 1998
2nd edition, 2003
Chinese edition, 2004

© KPA

MOTOROLA

"At Motorola we use statistical methods daily throughout all of our disciplines to synthesize an abundance of data to derive concrete actions…. How has the use of statistical methods within Motorola Six Sigma initiative, across disciplines, contributed to our growth? Over the past decade we have reduced in-process defects by over 300 fold, which has resulted in a cumulative manufacturing cost savings of over 11 billion dollars"*.

Robert W. Galvin
Chairman of the Executive Committee
Motorola, Inc.

*From the forward to MODERN INDUSTRIAL STATISTICS by Kenett and Zacks, Duxbury, 1998

© KPA Ltd., 2007

General Electric

- In 1995 mandated each GE employee to work towards achieving 6 sigma
- The average process at GE was 3 sigma in 1995
- In 1997 the average reached 3.5 sigma
- GE's goal is to reach 6 sigma by 2001
- Investments in 6 sigma training and projects reached 45MUS$ in 1998, profits increased by 1.2BUS$

"the most important initiative GE has ever undertaken".

Jack Welch
Chief Executive Officer
General Electric

© KPA Ltd., 2007

Alcoa
Ford
Lear Corporation
American Express
ABB
Dow
DuPont
Nokia
3M
Verbatim

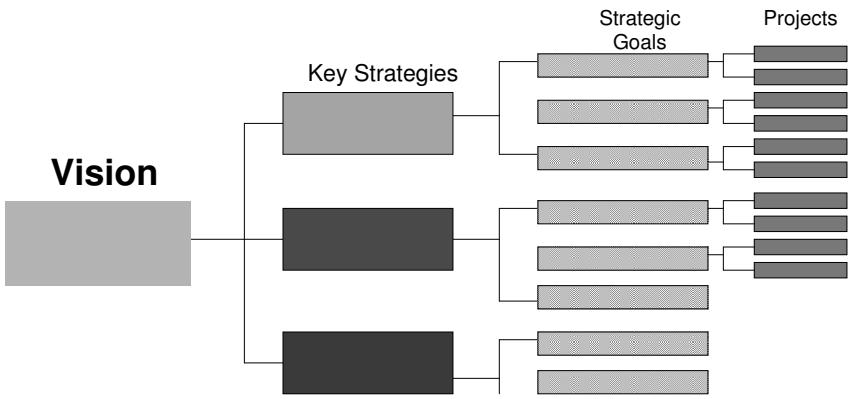
Caterpillar Inc
Texas Instruments
American Express
LG
Air Products
Xerox
Avery
JP Morgan-Chase
Invensys
Seagate
Cummins
Navistar
GKN
Nokia

© KPA Ltd., 2007

A.B. Dick Company, Abbott Labs, Adolph Coors, Advanced Micro Devices, Aerospace Corp, Airborne, Alcoa, Allen Bradley, Allied Signal, Ampex, Apple Computers, Applied Magnetics, ASQC, Atmel, Baxter Pharmaseal, Beatrice Foods, Bell Helicopter, Boeing, Bombardier, Borden, Bristol Meyers - Squibb, Bryn Mawr Hospital, Campbell Soup, Cellular 1, Chevron, Citicorp, City of Austin, TX, City of Dallas, TX, Clorox, Cooper Ind, Dannon, Defense Mapping Agency, Delnosa (Delco Electronics in Mexico), Digital Equipment Corp, DTM Corp, Eastman Kodak, Electronic Systems Center, Empak, Florida Dept. of Corrections, Ford Motor Company, GEC Marconi, General Dynamics, General Electric, Hazeltine Corp, Hewlett packard, Holly Sugar, Honeywell, Intel, Junior Achievement, Kaiser Aluminum, Kraft General Foods, Larson & Darby, Inc, Laser Magnetic Storage, Lear Astronics, Lenox China, Littton Data Systems, Lockhed Martin, Loral, Los Alamos National labs, Martin Marietta, McDonnell Douglas, Merix, Microsoft, Morton Int'l, Motorola, NASA, Nat'l Institute of Corrections, Nat'l Institute of Standards, Nat'l Semiconductor, Natural Gas Pipeline Company of America, Northrop Corp, PACE, Parkview Hospital, Pentagon, Pharmacia, PRC, Inc, Qualified Specialists, Ramtron Corp, Rockwell Int'l, Rohm & Haas, Seagate, Society of Plastics Egineers, Solar Optical, Sony, Star Quality, Storgae Tek, Symbios Logic, Synthes, Technicomp, Tessco, Texaco, Texas Commerce Bank, Texas Dept. of Transportation, Texas Instruments, Titleist, Trane, TRW, Ultratech Stepper, United States Air Force, United States Army, United technologies, UPS, USAA, Verbatim, Walbro Automotive, Walker parking, Woodward Governor, Xerox

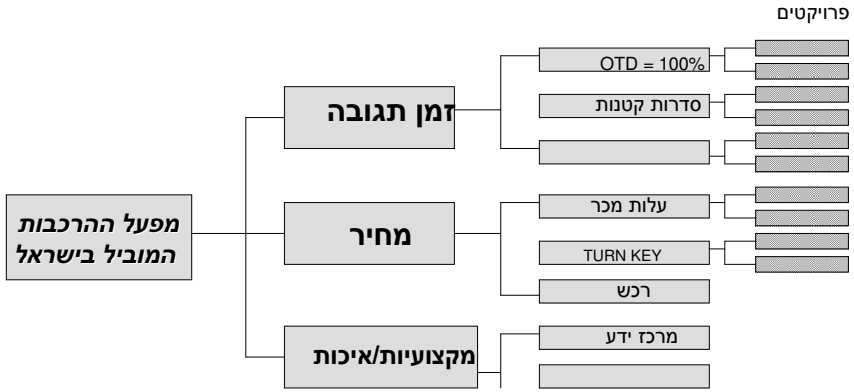
© KPA Ltd., 2007

Deploying the vision



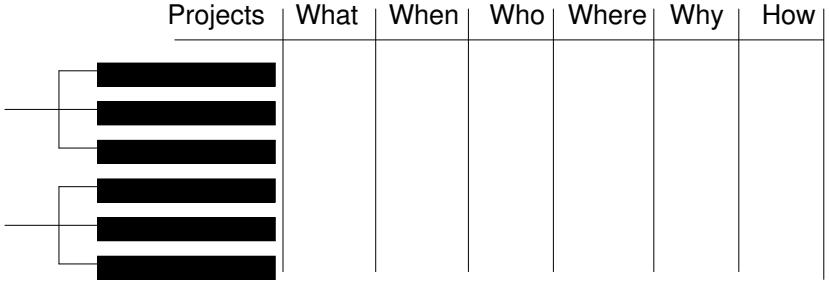
© KPA Ltd., 2007

פריסת מטרות



© KPA Ltd., 2007

Deploying the vision



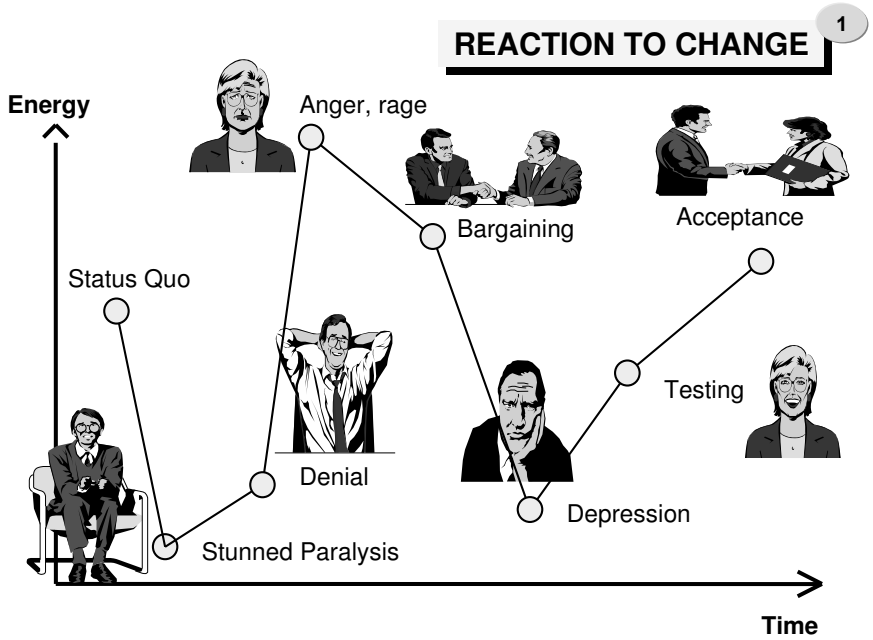
© KPA Ltd., 2007

Six Sigma Projects

Define	Select a project
Measure	Map out the current situation
Analyze	Characterize the current situation
Improve	Optimize the process
Control	Hold the gains

DMAIC

© KPA Ltd., 2007



2

אסטרטגיה עסקית

2

Models for Strategic Planning

1) קנת רון, "תכנון אסטרטגי לאיכות ככוח מניע", ניהול, דצמבר 1993.

2) קנת רון, עתי זיו ואורי קן-דרור, " בחינת חלופות אסטרטגיות על בסיס מדדים פיננסיים , הכנס הבינלאומי של האיגוד הישראלי לאיכות, ירושלים 2000.

2

Background

- Portfolio management and the prioritization of new product projects has become critical management task in the past decade.
- An estimated 50 percent of a firm's sales today come from new products introduced to the market within the previous five years.

Definitions - 1

Business Strategy – Specifies the goals, direction and areas of focus for the business unit.

Business Unit (BU) – This is the smallest unit in the company for which portfolio management is undertaken. Usually a BU (or SBU – strategic business unit) has its own goals, strategy, and resources. For example, a BU is likely to have its own R&D budget. For smaller firms, the BU may be the entire company.

© KPA Ltd., 2007

Definitions - 2

New Product Strategy – This is a component of or (flows from) the business strategy. It specifies goals, direction, and areas of focus (that is areas in which product development efforts will focus). It may even specify desired levels of R&D and new product spending in specific arenas of focus (for example, how much to spend on certain markets or product categories).

© KPA Ltd., 2007

Definitions - 3

Portfolio management for new products **-** Portfolio management for new products is a dynamic decision process wherein the list of active new products and R&D projects is constantly revised. In this process, new projects are evaluated, selected, and prioritized. Existing projects may be accelerated, killed, or de-prioritized and resources are allocated and reallocated to the active projects. The portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decision makers and locations.

© KPA Ltd., 2007

Definitions - 4

Portfolio Models – These are the specific models or tools used to select projects or review the portfolio. They include scoring models, bubble diagrams and maps charts, financial models, and strategic approaches.

© KPA Ltd., 2007

Portfolio Management Methods

- Financial or economic models
- Scoring models and checklists
- Probabilistic financial models
- Behavioral approaches
- Mathematical optimization procedures
- Decision Support Systems (DSS)
- Mapping Approaches

© KPA Ltd., 2007

Which Dimensions to Consider?

Sample list of possible parameters to consider. Any pair can be the X and Y axes for a bubble plot:

- Fit with business or corporate strategy (low, medium, high)
- Inventive merit
- Strategic importance to the business (low, medium, high)
- Durability of the competitive advantage (short, medium, long-term)
- Reward based on financial expectations (modest to excellent)
- Competitive impact of technologies (base, key, pacing, and embryonic technologies)
- Probabilities of success (technical and commercial success as percentages)

© KPA Ltd., 2007

Dimensions to Consider - 2

- R&D costs to completion (dollars)
- Time to completion (years)
- Capital and marketing investment required to exploit (dollars).
- Markets or market segments (market A, market B, etc.)
- Product categories or product lines (product line M, product line N, etc.)
- Project types (new products; product improvements; extensions and enhancements;

Maintenance and fixes; cost reductions; and fundamental research

- Technology or platform types (technology X, technology Y, etc.).

© KPA Ltd., 2007

Strategic Assessment variables
Market Attractiveness

•Market growth rate	•Market barriers to entry/exit
•Market profitability	•Access to critical/special components
•Volatility of market demand	•Rate of technological change
•Customer bargaining power	•Technology/Innovation importance as perceived by customers
•Price elasticity	•Regulatory climate
•Customer brand loyalty	•Volatility of exchange rates/inflation/political situation
•Product differentiation	•Level of competition after analyzing the characteristics of competition
•Stage in life cycle	•Threats by alternative solutions

© KPA Ltd., 2007

Strategic Assessment variables **Relative Market position**

- Relative market share
- Market share growth
- Company's image as perceived by customers
- Customer loyalty to our company
- Company's prices relative to competitors
- Company's quality relative to competitors
- Company's service relative to competitors
- Leader in technological innovation
- Marketing skills and strength
- Relationships with regulators
- Distribution network coverage
- Distribution network effectiveness
- After-sales service
- Probability of marketing plan success
- Overall competitive position

© KPA Ltd., 2007

Strategic Assessment variables **Technology and Finance**

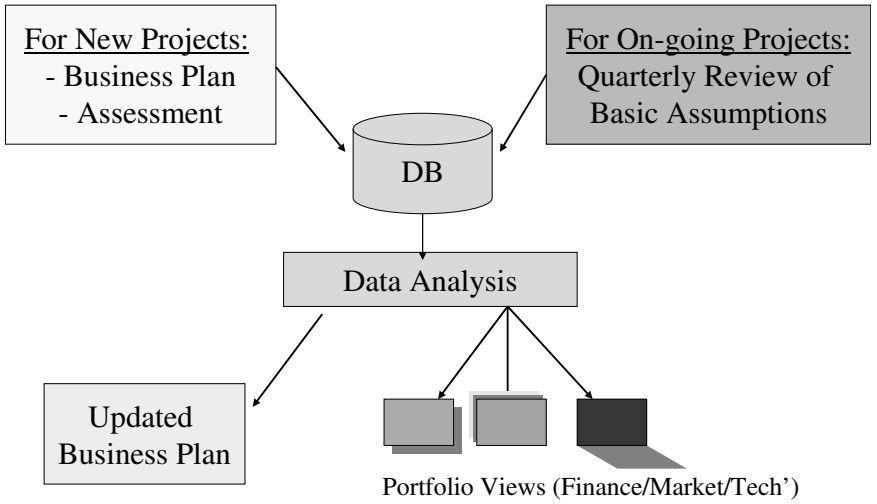
- Innovation
- Technological competitive strength
- Patented technology, product or process
- Technology skills (production)
- Production efficiency
- Relative cost position
- Quality of personnel
- Company's responsiveness
- Probability of technical success
- Potential Reward

© KPA Ltd., 2007

Strategic Model Categories:

- **Marketing**
- **Technology**
- **Finance**

© KPA Ltd., 2007



© KPA Ltd., 2007

Table of Content

Market Oriented Portfolios
- The market attractiveness competitive position matrix
- The ADL Model

Technology Oriented Portfolios
- The Technology Portfolio
- Booz Innovation Model

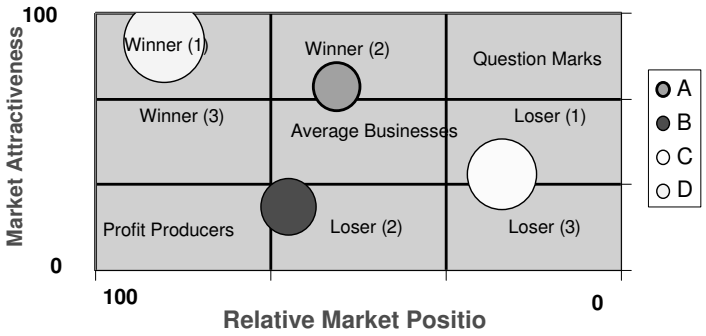
Finance Oriented Portfolios
- The Risk-Reward Model
- The Real Options Model

Market Oriented Portfolios

- The market attractiveness competitive position matrix

- The ADL Model

The market attractiveness competitive position matrix



Note: The circles in the diagram indicate relative sales

The market attractiveness competitive position matrix

Relative market dominance variables:
- Market growth rate
- Market profitability
- Volatility of market demand
- Customer bargaining power
- Price elasticity
- Customer brand loyalty
- Product differentiation
- Market barriers to entry/exit
- Access to critical/special components
- Rate of technological change
- Regulatory climate
- Volatility of exchange rates/inflation/political situation
- Level of competition after analyzing the characteristics of competition
- Threats by alternative solutions

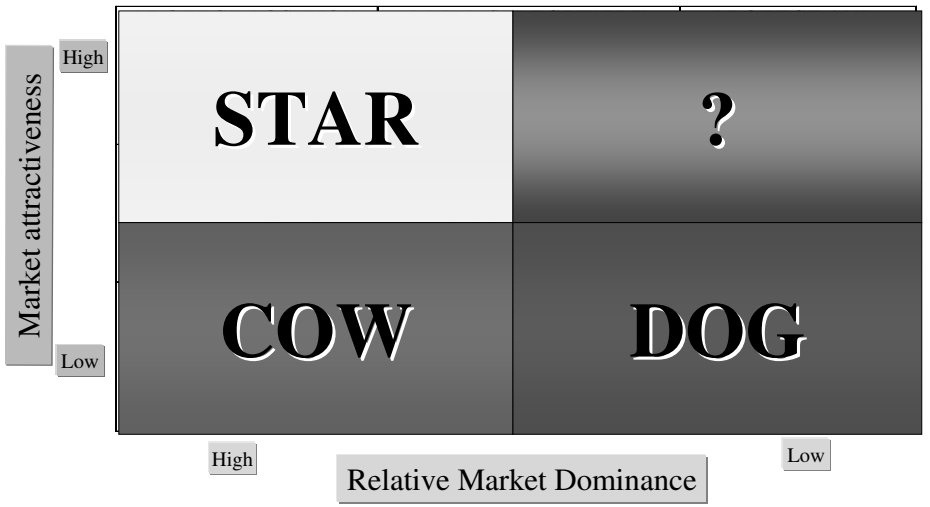
Market Attractiveness variables:
- Relative market share
- Market share growth
- Company's image as perceived by customers
- Customer loyalty to our company
- Company's prices relative to competitors
- Company's quality relative to competitors
- Company's service relative to competitors
- Leadering technological innovation
- Marketing skills and strength
- Relationships with regulators
- Distribution network coverage
- Distribution network effectiveness
- After-sales service
- Technological competitive strength
- Patented technology, product or process
- Technology skills (production)
- Production efficiency
- Relative cost position
- Quality of personnel

The market attractiveness competitive position matrix

- The model focuses on future profits.
- The Y axis represents the industry attractiveness.
- The X axis represents the business strength- comprises of market position and competitive strength.
- The DPM and BCG models that are not presented, are very similar to this model

© KPA Ltd., 2007

The BCG model



© KPA Ltd., 2007

The BCG model

Market attractiveness

High

Low

WINNER (1)	WINNER (2)	QUESTION MARKS
WINNER (3)	AVERAGE BUSINESSES	LOSER (1)
PROFIT PRODUCERS	LOSER (2)	LOSER (3)

High

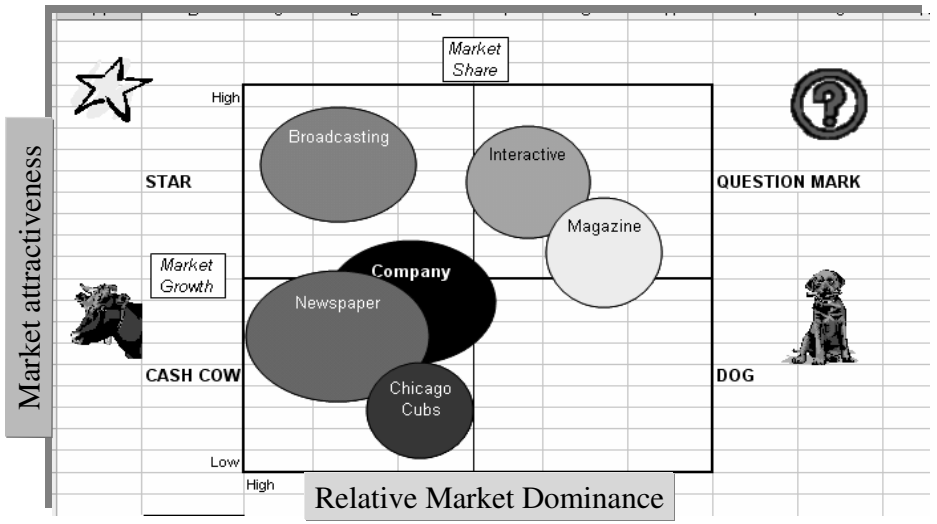
Low

Relative Market Dominance

© KPA Ltd., 2007

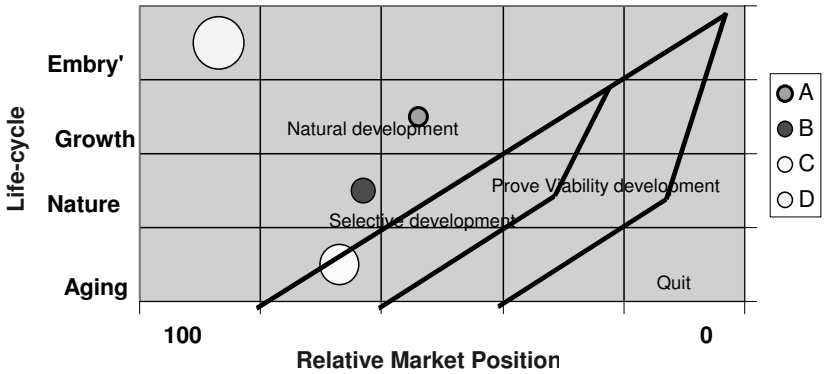
Chicago Tribune

The BCG model



© KPA Ltd., 2007

The ADL Model



Note: The circles in the diagram indicate relative sales

The ADL Model

Business-strength variables:

- Market growth rate
- Market profitability
- Volatility of market demand
- Customer bargaining power
- Price elasticity
- Customer brand loyalty
- Product differentiation
- Market barriers to entry/exit
- Access to critical/special components
- Rate of technological change
- Regulatory climate
- Volatility of exchange rates/inflation/political situation
- Level of competition after analyzing the characteristics of competition
- Threats by alternative solutions

Life-cycle stage variable:

- Life-cycle stage

The ADL Model

- The planning focus is RONA (Return On Net Assets).
- The concept is a balanced corporate portfolio: Positive cash flow, the SBUs average weighted RONA meets corporate goals.
- The X axis represents relative market dominance.
- The Y axis represents stages in life-cycle: embryonic, growth, mature and aging.
- The planning of strategies is performed in consecutive steps: SBU's area in the matrix, SBU's cell in the matrix and generic strategy – an operational planning

The ADL Model

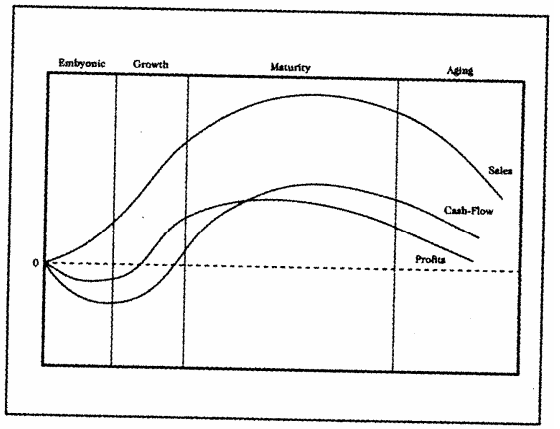


Figure 6.2 Yearly sales, cash flow, and profits through the industry life-cycle stages.

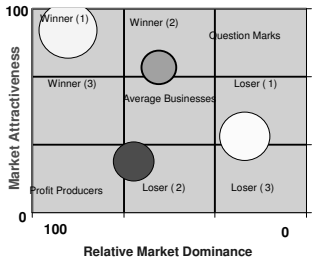
Technology Oriented Portfolios

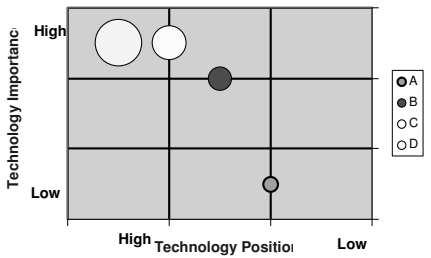
- The Technology Portfolio
  - Booz Innovation Model

© KPA Ltd., 2007

The Technology Portfolio

Compared to Market attract'-competitive model





© KPA Ltd., 2007

The Technology Portfolio

Technology position variables:

- Technological competitive strength

Technology importance variable:

- Technology/Innovation importance as perceived by customers

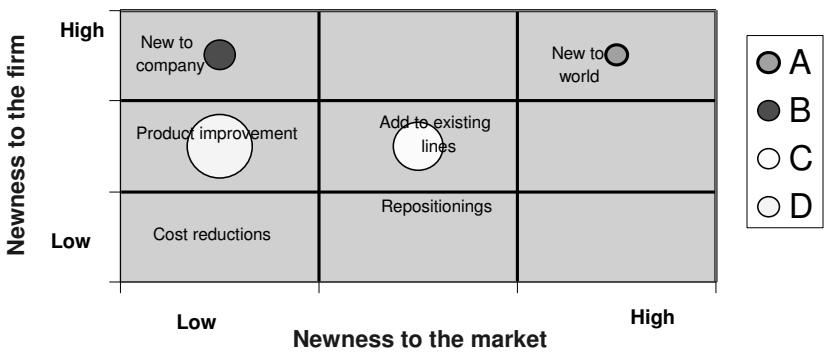
© KPA Ltd., 2007

The Technology Portfolio

- This framework examines the relationship between the traditional portfolio planning matrix (represented earlier by Market attract'-competitive model) and the technology portfolio matrix.
- The two diagrams enable to investigate the match (or mismatch) of a firm's business and technology portfolios and its resulting technology investment priorities.

© KPA Ltd., 2007

Booz-Innovation Model



Note: The circles in the diagram indicate relative R&D budget

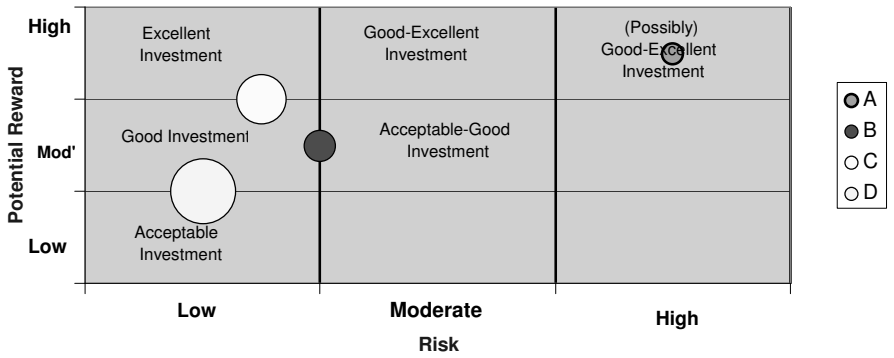
Booz-Innovation Model

- This framework is useful way to interlink different formats of innovation.
- There is a generic typology of strategy on the basis of the speed of response to changes in product-market environment.

Finance Oriented Portfolios

- The Risk-Reward Model
- The Real Options Model

The Risk-Reward Model



Note: The circles in the diagram indicate relative Investments.

The Risk-Reward Model

Risk variables:

- Probability of marketing plan success
- Probability of technical success

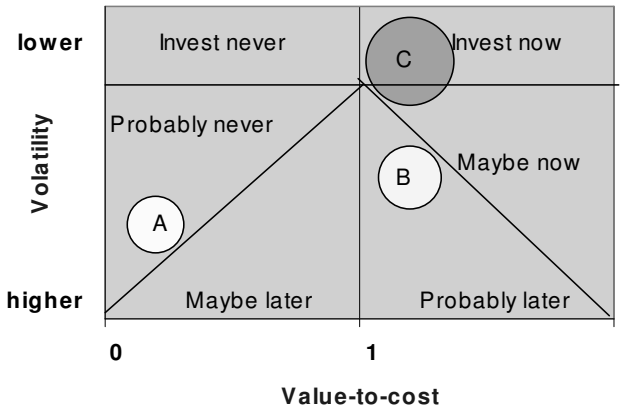
Potential Reward variable:

- Potential Reward

The Risk-Reward Model

- Focuses conclusively on profitability.
- The model aims to increase productivity of investments.
- Risk is built-in in the model in comparison to the rest of models, where we could add risk as third dimension.

The Real Options Model



The Real Options Model

- The model suggests monitoring the options and looking for ways to influence the variables that determine option value and outcomes.
- The option space helps to determine whether to invest or not, when to invest and what to do on the meantime.
- The X axis represents the net present value and time value of the ability to defer the investment.
- The Y axis represents how much things can change before an investment decision must finally be made.
- Option space gives us 6 possible actions that reflect the likelihood of the project ending successfully in the future.
- In a dynamic approach there is a possibility to nest options.

References

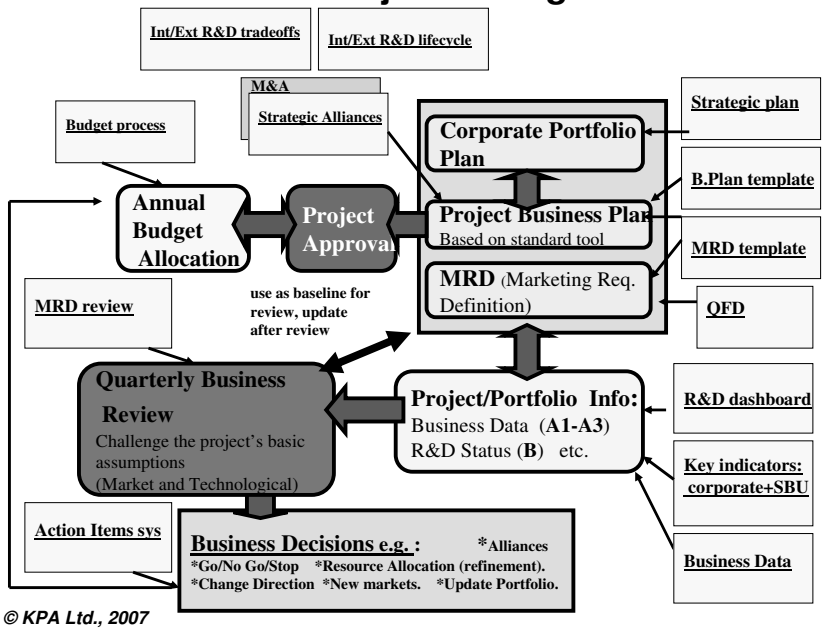
1. **Strategic Management of Technology and Innovation**, Burgelman, Maidique, Wheelwright, IRWIN, 2nd edition, 1998.
2. "Strategy as a Portofolio of Real Options", Luehrman, Harvard Business Review, 1998.
3. **Corporate Strategy**, Segev, THOMPSON PUBLISHING, 1995.
4. **Competitive Advantage**, Porter, Free Press, 1985.
5. **Third Generation R&D**, Roussel, Saad, Erickson, Harvard Business School Press
6. "Choosing between Strategic Alternatives using Financial Indices", Kenett, Ziv(in Hebrew), Kesher Haeihut, 40-41, pp. 10-13, March 2002.
7. **Strategic Management**, Wheeler, Hunger, Addison-Wesley 6th edition, 1998

© KPA Ltd., 2007

Project/Portfolio Management

© KPA Ltd., 2007

R&D Portfolio/Project Management Process



© KPA Ltd., 2007

Portfolio/Project measurements

- *What is the goal?*
- **Simple Standard Measurements for planning, reviewing, assessing and supporting decision making on R&D critical decisions on both individual projects and portfolio level. (e.g. resource allocation, marketing decisions etc.)**
- *Who will it serve?*
- R&D managers, Product managers, Executive management.
- *How will it work?*
- Simple analysis through standard questionnaire and Excel-style template of the business plan. Presentation in quarterly reports and reviews.
- *What is the scope?*
- **A**. Business Measurements:
- **1.** Market Portfolio (Market position, Market Attractiveness)
- **2**. Technology Portfolio (Technology Position, Technology Potential)
- **3**. Project Evaluation (Financial Attractiveness vs Probability of success).
- **B**. Status of the project

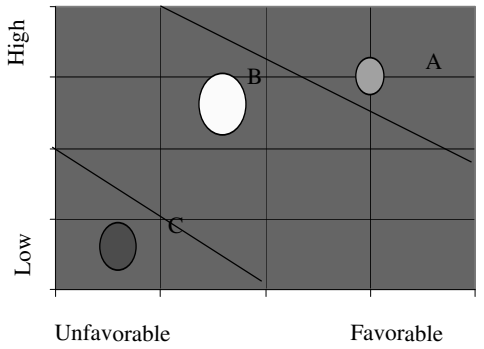
© KPA Ltd., 2007

Scope A1: Market Portfolio

* **Purpose**: Information on own market position and on market attractiveness from company's point of view.
* **Market position:** Company's current position in the world market. Regionally differing positions are to be specified.
* **Market Attractiveness:** Future attractiveness (over 2 years) of the market from company point of view.

© KPA Ltd., 2007

Scope A1: Market Portfolio



Market Attractiveness

Key Question

Attractive business?

Business Strategy

Grow / Develop

Maintain / Monitor / Hold

Harvest / Cash

Size of circle = Annual Sales

© KPA Ltd., 2007

Scope A1: Market Portfolio

Position

- Market share
- Internal use
- Earning situation
- Logistics
- Marketing competence
- Product quality
- Customer structure
- Product range

Attractiveness

- Market Growth
- Market volume
- Substitution
- Internal use
- Entrance barriers
- Earning prospects
- Supplier structure
- Buyer structure
- Environmental situation

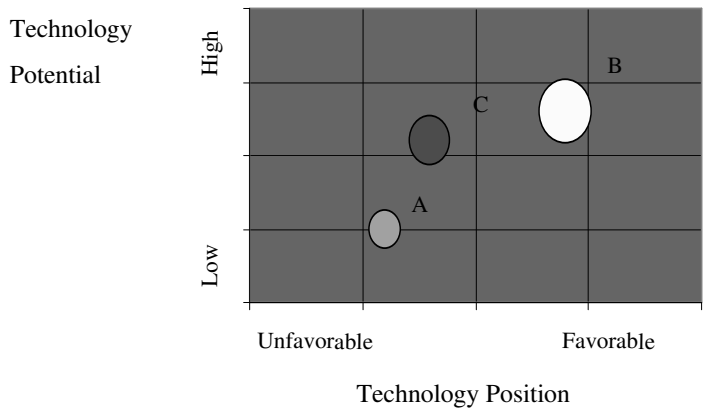
© KPA Ltd., 2007

Scope A2 : Technology Portfolio

* **Purpose**: The total of all company's technological achievements relating to a product or product group.
* **Technology Position:** Status of own technology in comparison with current and potential future competitors.
* **Technology Potential:** Development capacity of our current technology. The Potential should be achievable and of benefit to the company.

© KPA Ltd., 2007

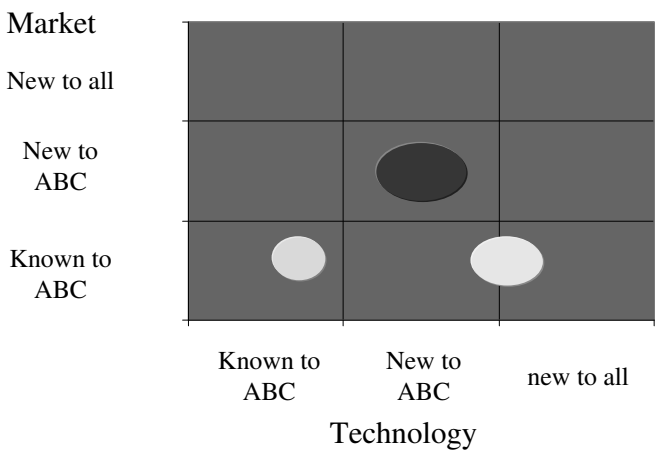
Scope A2 : Technology Portfolio



Size of circle = Cumulative R&D expenditure to completion

© KPA Ltd., 2007

Scope A2 : Technology Portfolio



© KPA Ltd., 2007

Scope A2 : Technology Portfolio

Position / Potential

- Innovation potential through R&D.
- Process (improvement of existing process).
- Manufacturing / Infrastructure.
- Patents / Licenses.
- Costs
- Risks.
- Competitors.

© KPA Ltd., 2007

Scope *A2* cont. :GENERALIZED TEMPLATE FOR DETERMINIG TECHNOLOGICAL COMPETITIVE STRENGTH

Description	Characteristics
Dominant	• Powerful Technological leader. • High commitment, funds, manpower, creativity • Well recognized in industry. • Sets pace and direction for technological development. • Competitors consistently seek to catch up.
Strong	• Able to Express independent technical action, set new directions. • Technological commitment and effectiveness consistently high. • Technological accomplishments distinguish its strategic business units (SBU) lesser competitors.
Favorable	• Able to sustain the technological competitiveness of the SBU it serves. • Has strengths that can be exploited to improve technological competitive position. • Not a technological leader except in developing niches.
Tenable	• In a catch up mode. • Unable to set independent course. • Can maintain competitiveness of SBU, but unable to differentiate from competitors'.
Weak	• Declining quality of technical output versus competitors. • Short-term, fire fighting focus. • Products, processes, cost slipping relative to competitors. • Difficult but not impossible to turn around.

© KPA Ltd., 2007

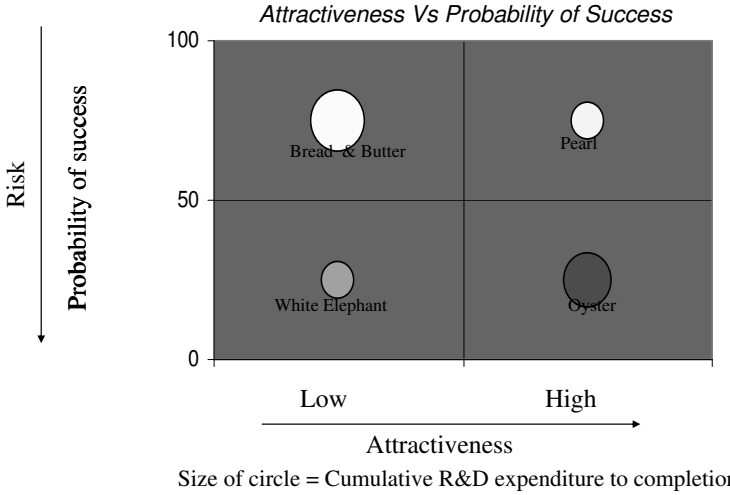
Scope A3 : Project Evaluation Definitions

* **Purpose**: To calculate and present the attractiveness Vs probability of success (Due to Market or Technology risks).

* **Financial Attractiveness:** could be calculated through NPV, decision tree or Real options.

© KPA Ltd., 2007

Scope A3 : Project Evaluation



Size of circle = Cumulative R&D expenditure to completion

© KPA Ltd., 2007

Scope B: Projects Status

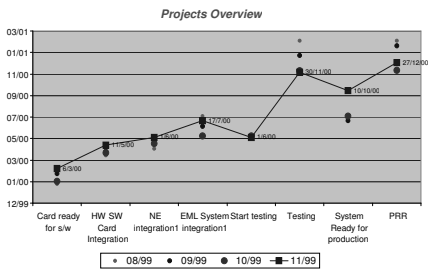
* **Purpose**: A quick glance of ongoing projects status through a standard performance measurements dashboard.

* **Measurements:** System Development Management Dashboard (SDMD)

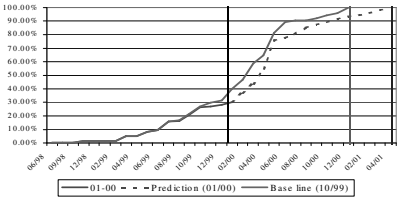
* **Milestones Overview :** Estimated due date of major milestone compared to last review estimation and base line.

© KPA Ltd., 2007

Scope B cont.: Dashboard of project x

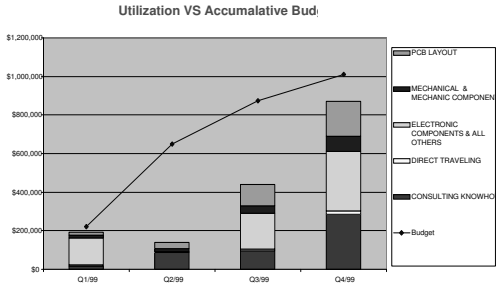


Project 's EVA measurement



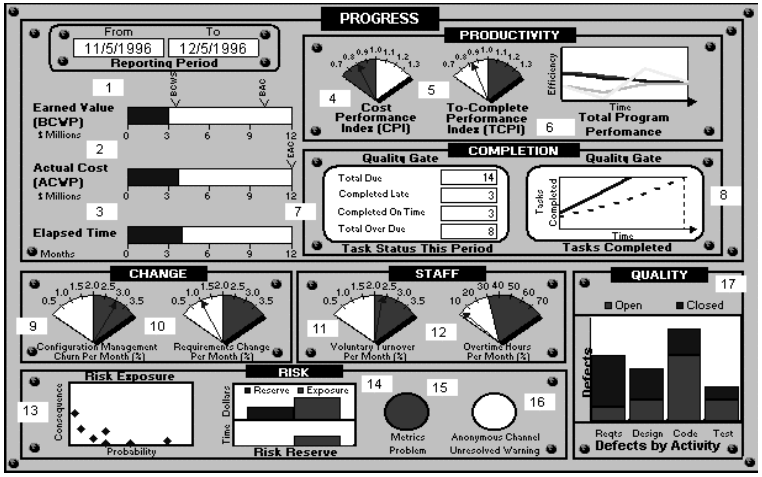
Deviation on update (01/00) 10.03%

Project delay (from 12/00 to 4/01) 121 days



Quality Gates	
Total Due:	**60%**
Completed on Time	**50%**
Over Due:	**10%**

Scope B cont.: Software Development Management Dashboard of project x



Real Options

A Strategy for Planning and Managing Project Portfolios

1) Investment Opportunities as Real Options: Getting Started on the Numbers, Luehrman, T., Harvard Business Review, July 1998.

2) Strategy as a Portfolio of Real Options, Luehrman, T., Harvard Business Review, September 1998.

3) Choosing between Strategic Alternatives using Financial Indices (in Hebrew) Kenett, R and A. Ziv, Kesher Haeihut, 40-41, pp. 10-13, March 2002.

The Real Options Model

OBJECTIVES

- Monitor options in a projects' portfolio
- Determine whether to invest or not, when to invest and what to do in the meantime.
- Option space with six possible actions
- Possibility to nest options.

The Real Options Model

PARAMETERS

- A: Underlying asset value ($millions)
- X: Exercise price ($ millions)
- t: Time to expiration (years)
- r: Risk-free rate of return (% per year)
- S^2: Variance of return on investment

The Real Options Model

ANALOGY

A: Present value of a project's operating assets to be acquired

>>>> Stock price

X: Expenditure required to acquire the project assets

>>>> Exercise price

t: Length of time the decision may be deferred

>>>> Time to expiration

r: Time value of money

>>>> Risk-free rate of return

S^2: Risk of project assets

>>>> Variance of returns on stock

© KPA Ltd., 2007

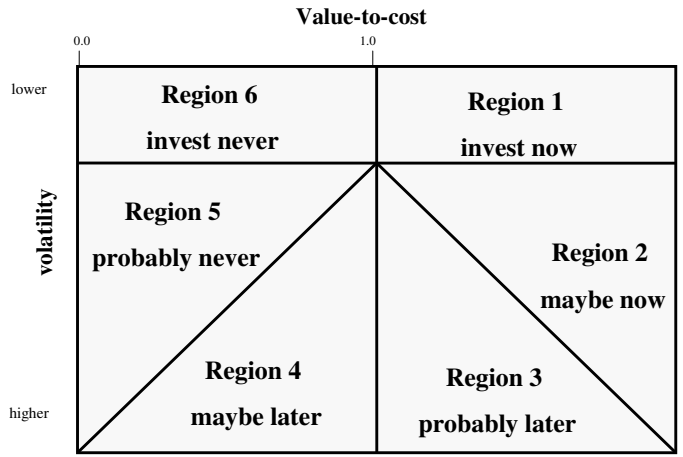
The Real Options Model

MODEL DIMENSIONS

- **NPV: Naïve Net Present Value = A - X**
- **PV(X): Present Value = X / (1+r) ^t**
- **A / PV(X): Value to Cost Ratio**
- **S[t^0.5]: Volatility per year**

© KPA Ltd., 2007

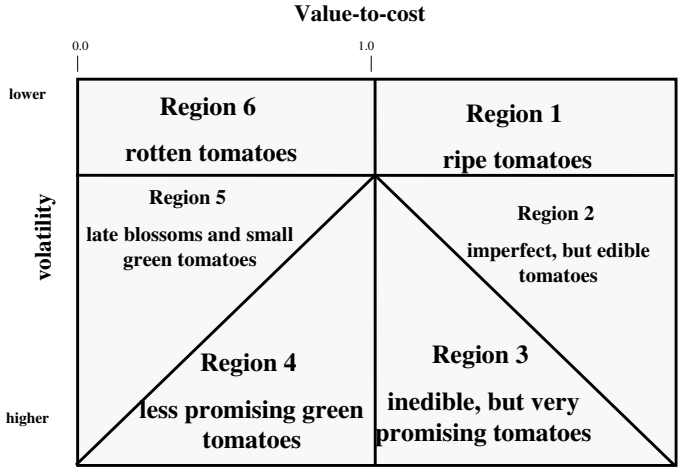
The Real Options Classification



© KPA Ltd., 2007

The Real Options Classification

The tomato garden analogy



© KPA Ltd., 2007

Six Benchmark Projects

Variable	F	E	D	C	B	A	Portfolio value
A	100	100	100	100	100	100	
X	110	110	110	110	90	90	
t	2	1	0.5	0	2	0	
S	.30	.30	.30	.20	.30	.40	
r	0.06	0.06	0.06	0.06	0.06	0.06	
value to cost	1.021	0.964	0.936	0.909	1.248	1.111	
volatility	0.566	0.3	0.141	0	0.424	0	
Call value	23.24	10.42	3.06	0	27.23	10	73.95
Naïve NPV	- 10	- 10	- 10	- 10	10	10	20
Region	3	4	5	6	2	1	
Exercise Option	Probably later	Maybe later	Probably never	never	Maybe now	now	

Six Benchmark Projects

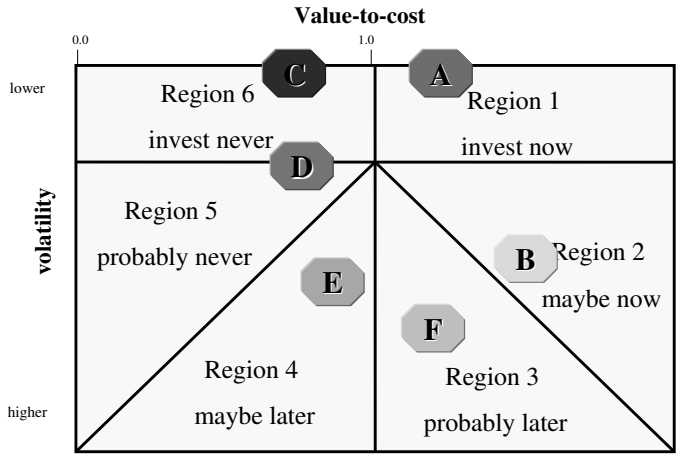
Variable		C		A	
A		100		100	
X		110		90	
t		0		0	
S		.20		.40	
r		0.06		0.06	
value to cost		0.909		1.111	
volatility		0		0	
Call value		0		10	
Naïve NPV		- 10		10	
Region		6		1	
Exercise Option		never		now	

Six Benchmark Projects

Variable	F	E	D	C	B	A	Portfolio value
A	100	100	100	100	100	100	
X	110	110	110	110	90	90	
t	2	1	0.5	0	2	0	
S	.30	.30	.30	.20	.30	.40	
r	0.06	0.06	0.06	0.06	0.06	0.06	
value to cost	1.021	0.964	0.936	0.909	1.248	1.111	
volatility	0.566	0.3	0.141	0	0.424	0	
Call value	23.24	10.42	3.06	0	27.23	10	73.95
Naïve NPV	- 10	- 10	- 10	- 10	10	10	20
Region	3	4	5	6	2	1	
Exercise Option	Probably	Maybe	Probably	never	Maybe		

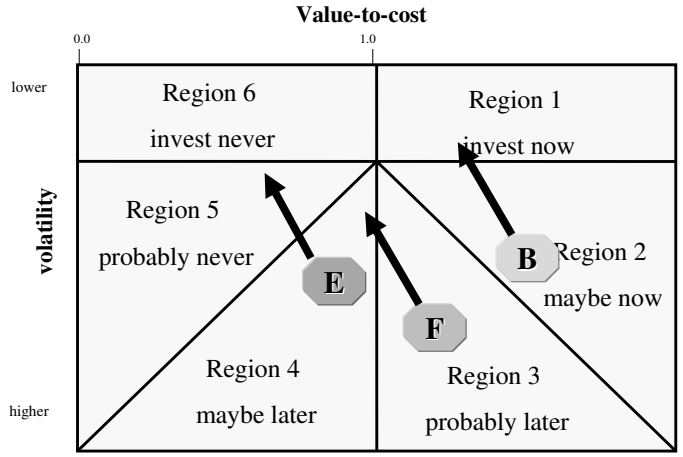
F E D C B A

Six Benchmark Projects



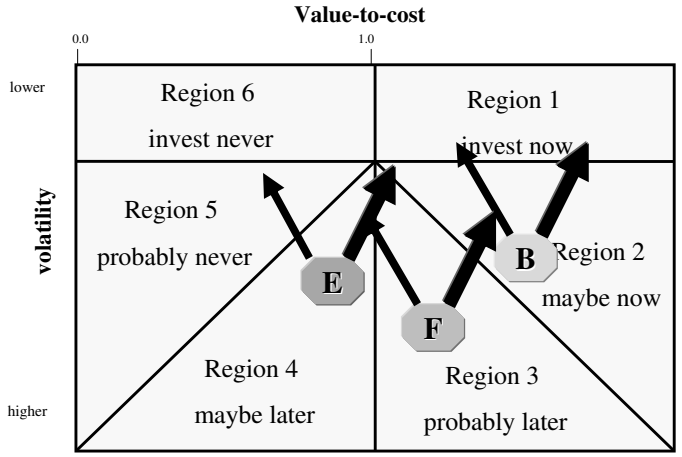
© KPA Ltd., 2007

The Effect of Time



© KPA Ltd., 2007

The Effect of Management



© KPA Ltd., 2007

Real Options Applications

- **Valuing a Start-up**
- **Investing in a Start-up**
- **Managing Long Term Projects**
- **Investing in R&D**
- **Investing in Infrastructure**
- **Investing to Preempt Competitors**

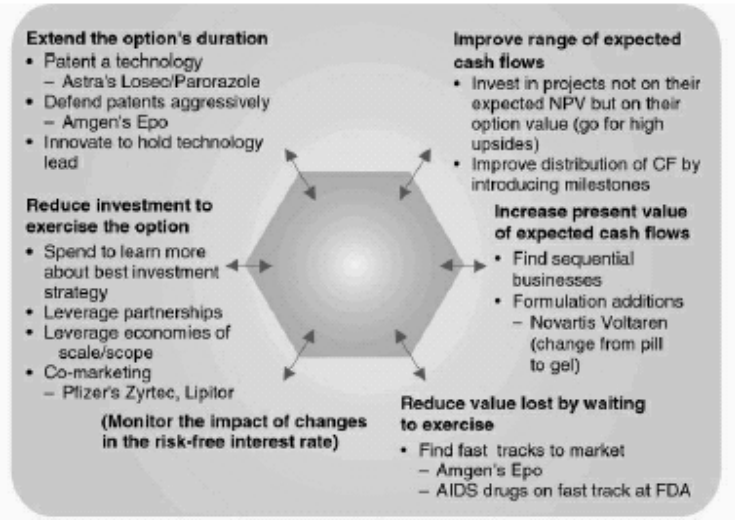
© KPA Ltd., 2007

Different types of real options

- **Option to defer**
- **Time to build option (Staged investment)**
- **Option to alter operating scale**
- **Option to abandon**
- **Option to switch**
- **Growth options**
- **Multiple interacting options.**

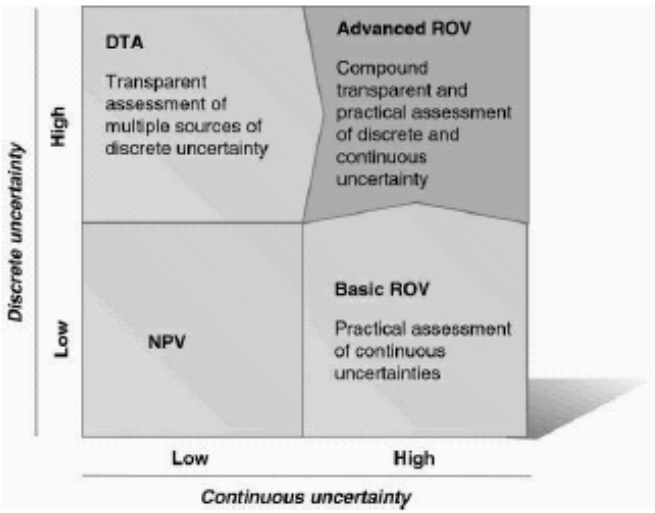
© KPA Ltd., 2007

Different types of real options



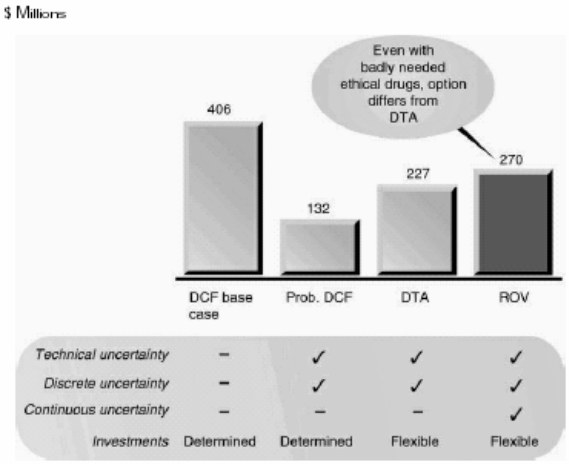
© KPA Ltd., 2007

Coping with uncertainty



© KPA Ltd., 2007

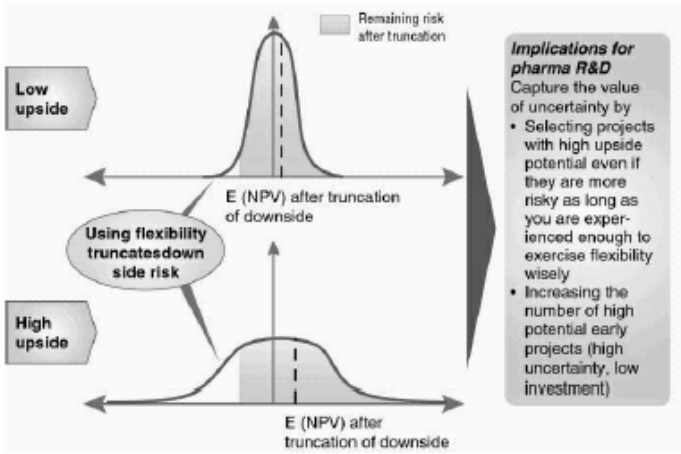
Comparison of project value



* Project value including investments at t = 0
Source: McKinsey analysis

© KPA Ltd., 2007

Value of uncertainty



© KPA Ltd., 2007

References

Amram, M., and Kulatilaka, N., *Real Options: Managing Strategic Investment in an Uncertain World,* Boston, MA: Harvard Business School Press, 1998.

Eisenhardt, K. and Brown, S., "Patching: Restitiching Business Portfolios in Dynamic Markets", *Harvard Business Review*, May 1999.

Kenett, R.S., Ziv A."Choosing between Strategic Alternatives using Financial Indices", (in Hebrew), *Kesher Haeihut*, 40-41, pp. 10-13, March 2002.

Kellog D. and Charnes, J., "Real-Options Valuation for a Biotechnology Company", *Financial Analysts Journal*, pp. 76-84, May/June 2000.

Luehrman, T., "Investment Opportunities as Real Options: Getting Started on the Numbers", *Harvard Business Review*, July 1998.

Luehrman, T., "Strategy as a Portfolio of Real Options", *Harvard Business Review*, September 1998.

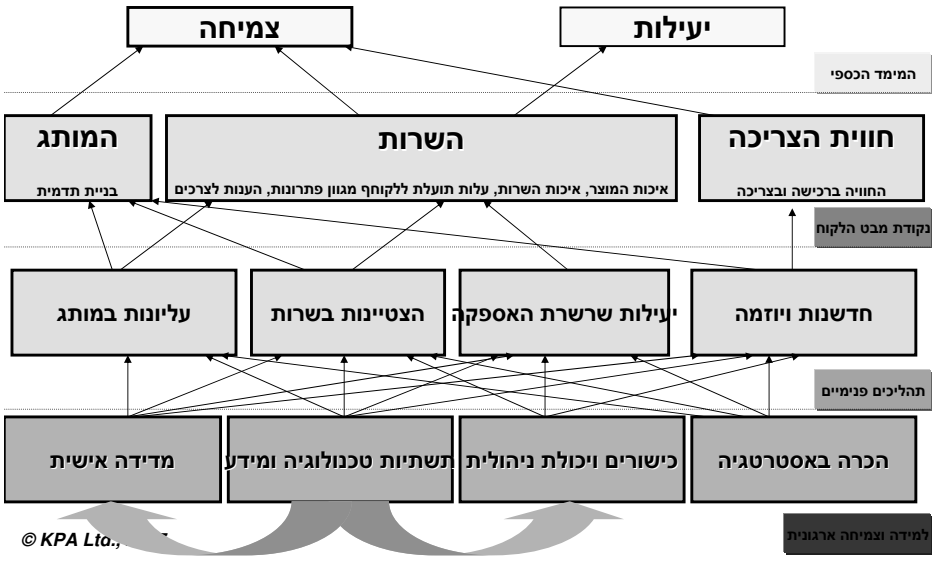
Trigeorgis, L., *Real Options, Managerial Flexibility and Strategy in Resource Allocation*, The MIT Press, Cambridge, Massachusetts, 1997.

© KPA Ltd., 2007

אפות ורחות מדדים

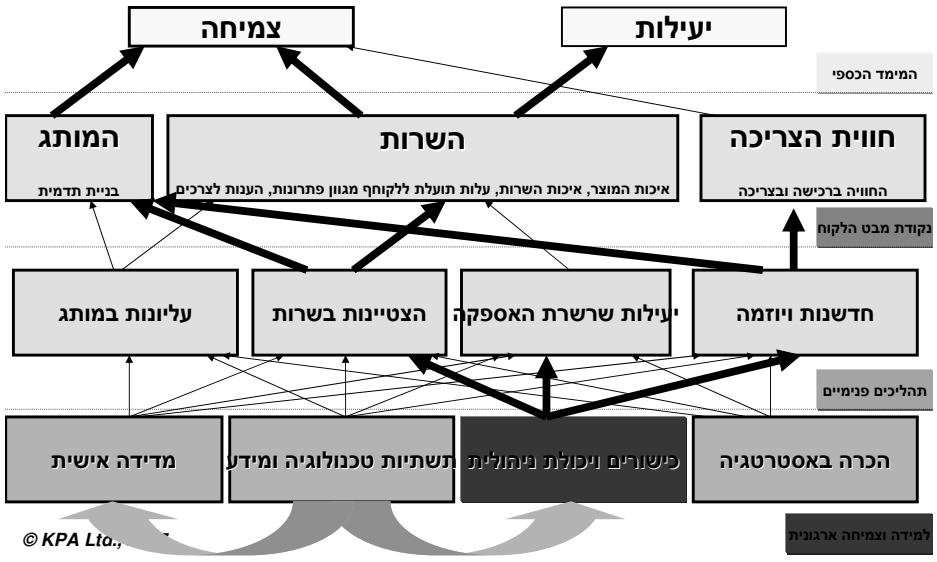
© KPA Ltd., 2007

מפה אסטרטגית



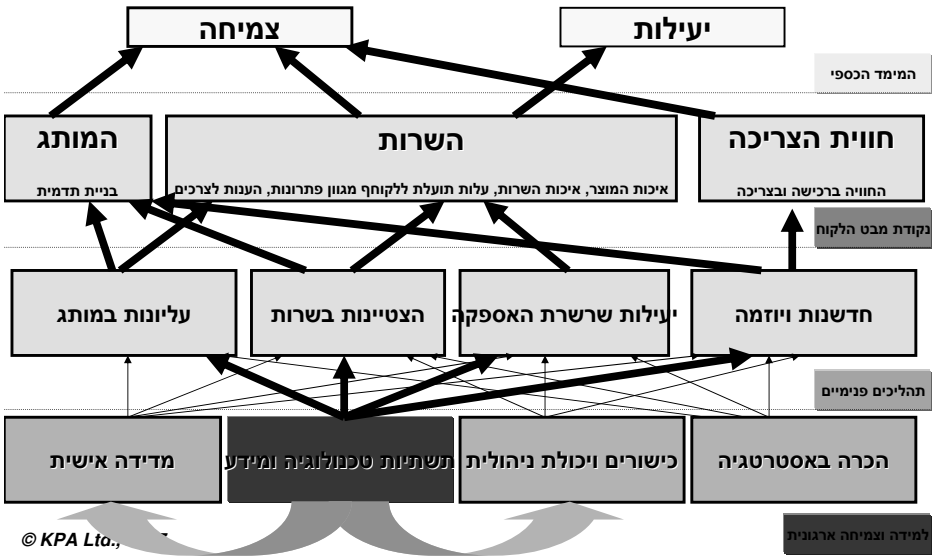
© KPA Ltd.,

מפה אסטרטגית



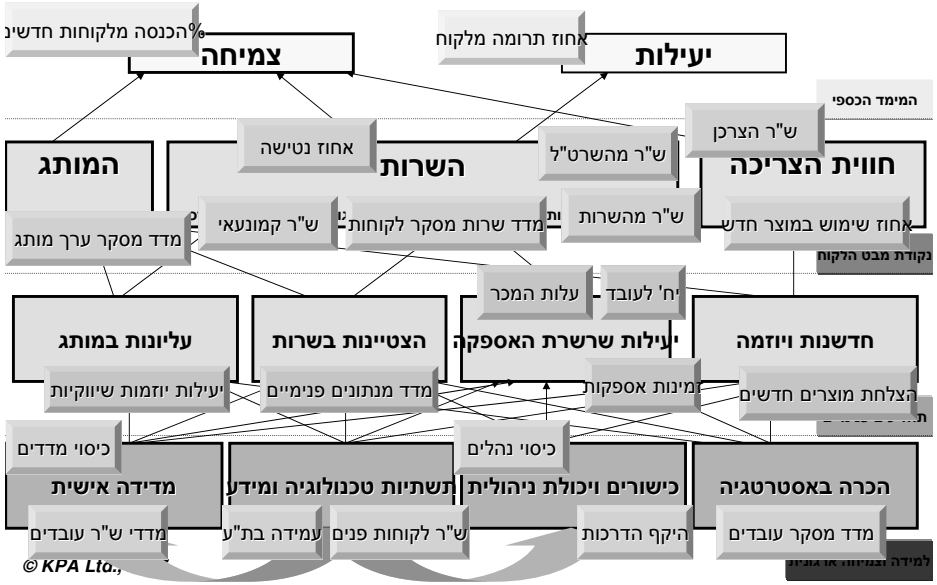
© KPA Ltd.,

מפה אסטרטגית



© KPA Ltd.,

מדדים ארגוניים

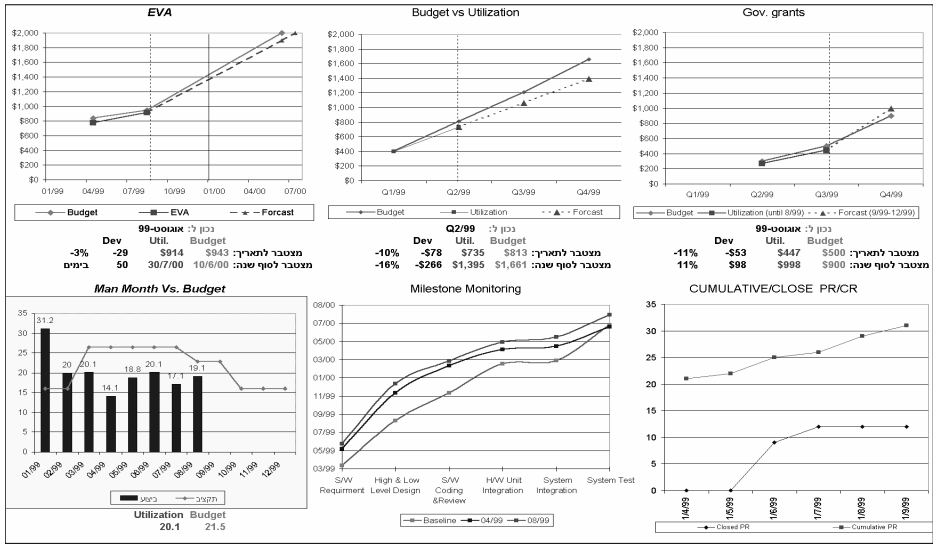


© KPA Ltd.,

לוח מדדים ארגוניים

© KPA Ltd., 2007

לוח מדדים ארגוניים



© KPA Ltd., 2007

References

1) קנת רון ועתי זיו, " גיבוש אסטרטגיה מאוזנת בחברות טכנולוגיות ", הכנס הלאומי של האיגוד הישראלי לאיכות, תל אביב 2001.

2) The Balanced Scoreboard: Translating Strategy into Action, Kaplan, R. and Norton, D., Harvard Business School Press, 1996.

3) Having Trouble with your Strategy? Then Map It, Kaplan, R. and Norton, D., Harvard Business Review, September 2000.

© KPA Ltd., 2007