



Portfolio Management at HP

DAAG 2005 Meeting
Philadelphia, PA

April 21, 2005
Michael Menke



History of Portfolio Management at HP



- First formal portfolio management in IPG ITP around 1999
 - IPG developed a sophisticated financial tool (FAST) to support this work
- Compaq developed a formal PM process for IT circa 2002 that the combined company adopted and uses corporate-wide
 - Supported by Primavera tool
- IPG has been trying to develop business PM since 2002-3
- The technology Committee of HP's Board of Directors requested a horizontal R&D portfolio view across all of HP in the summer of 2003; repeated in 2004
 - TSG was impressed by FAST and developed Slim-FAST
- Lot's of entities trying some form of PM during 2004 planning cycles. Major IPG PM **benchmarking effort**.
 - IPG used PM management to look at all of its new businesses in October 2004 using Decision Advisor tool from SmartOrg.
 - Enterprise Imaging & Printing unit of IPG developed a multi-level portfolio process in fall 2004 for 2005 SPaR process
- IPG begins a sector wide strategy review and leverages EIP portfolio design using a tool from ProSite
- HP establishes corporate team to formalize EWPM Dec. 2004

The next generation of product development, the R&D Productivity generation, goes beyond the Time-to-market generation “to include comprehensive resource management and integrated portfolio and product strategy.”

Michael E. McGrath, PRTM

Next Generation Product Development

- We used input from APQC, Bain, Best Practices LLC, Corporate Strategy Board, McKinsey, PRTM, SDG
- We analyzed company case studies from:
 - Dow, DuPont, IBM, Intel, J&J, Kodak, Lilly, Motorola, Nokia, Pfizer, Samsung, Shell
- We extracted information from company visits with Pfizer, Boeing,
- We also extracted information from telephone discussions with Abbott, BNR, Chevron and P&G
- In this presentation we use the terms portfolio management (PM) and resource allocation (RA) somewhat interchangeably
 - PM usually refers to investment portfolios and the resource allocated is money
 - RA usually refers to allocating people and skills to execute the projects

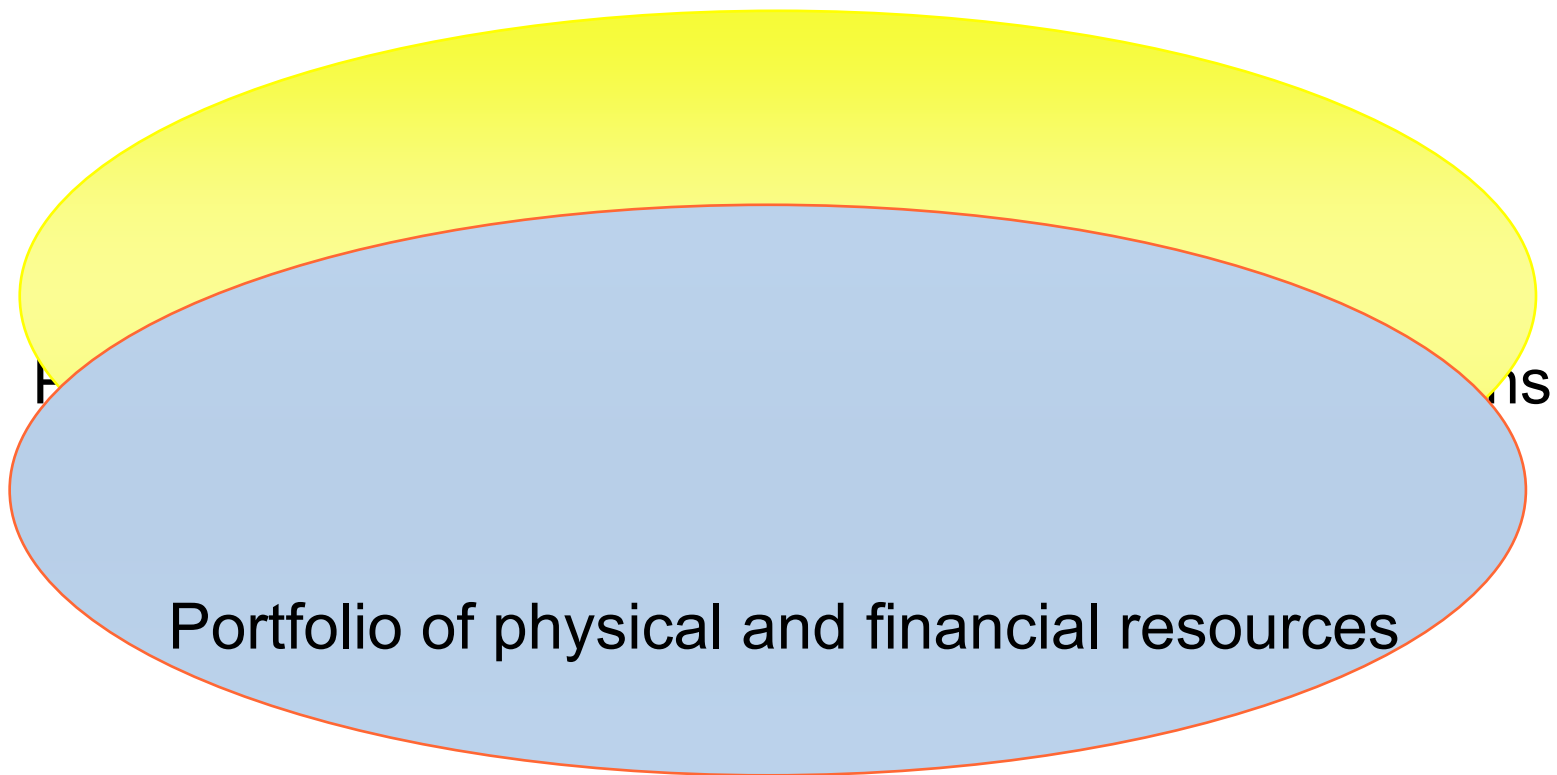
What is Portfolio Management (PM)?



- Portfolio management has two basic types:
- Strategic/investment portfolio management
 - The strategy development, evaluation, prioritization and optimal allocation of investment dollars for a set of competing opportunities: markets, businesses, strategic initiatives or investment projects
- Pipeline/resource portfolio management
 - The allocation of resources (people, skillsets, capacity) to a set of competing projects or opportunities to maximize the value and throughput of the project pipeline
- In both types of PM, the challenge is to optimize the value output for any given level of financial or human resource input, as well as to ensure that the portfolio is aligned in support of the organization's overall strategy and strategic intent

- **Portfolio of businesses and markets—strategy**
 - What markets do we want to play (and win) in?
 - What businesses should we enter or exit?
 - What businesses should get increased or decreased resources?
 - What initiatives will make us successful in our businesses?
- **Portfolio of investments within businesses—decisions**
 - How should we allocate resources across business functions?
 - How can we evaluate, compare and prioritize strategic initiatives and investment opportunities within businesses?
- **Portfolio of investments within functions—decisions**
 - How can we evaluate, compare and prioritize investment opportunities within functions?
 - Methods for optimization and incremental valuation in investment portfolios
- **Portfolio of resources (people) to execute the selected investments—resource planning and allocation**

Portfolio management exists on multiple levels



- In Leading Companies Portfolio Management is:
 - A strategic way of managing the business
 - A core management process
 - A decision, prioritization and resource allocation process
 - Done to achieve strategic alignment and maximum return
 - Performed on multiple levels
- Portfolio Management Best Practices:
 - Integrate portfolio management with strategy development, resource management, forecasting, executive compensation and budgeting
 - Ensure clear decision process and accountability
 - Shield the growth portfolio from short-term pressures
 - Use a consistent process, language and tools across all functions
 - Use analytical tools to deal with risk and use strategy/investment/project alternatives to optimize the portfolio return
 - Don't overload the project pipeline or the people

Industry Best Practice PM Process Flow



Corporate/Sector Strategic Agenda

Clear Guidance on Portfolio of Strategic Initiatives

- Assumptions Clear
- Target/Goals and Objectives Clear
 - Market and Competitive Assessment
 - Profit
 - Revenue
 - Cash Flow

Time

BU Portfolio

Region Portfolio

Horizontal Function Portfolio

- Well Characterized Investment Opportunities
 - Expected NPV
 - Investment
 - Risk
 - Efficient Frontier

Integrated Business Plans and Priorities



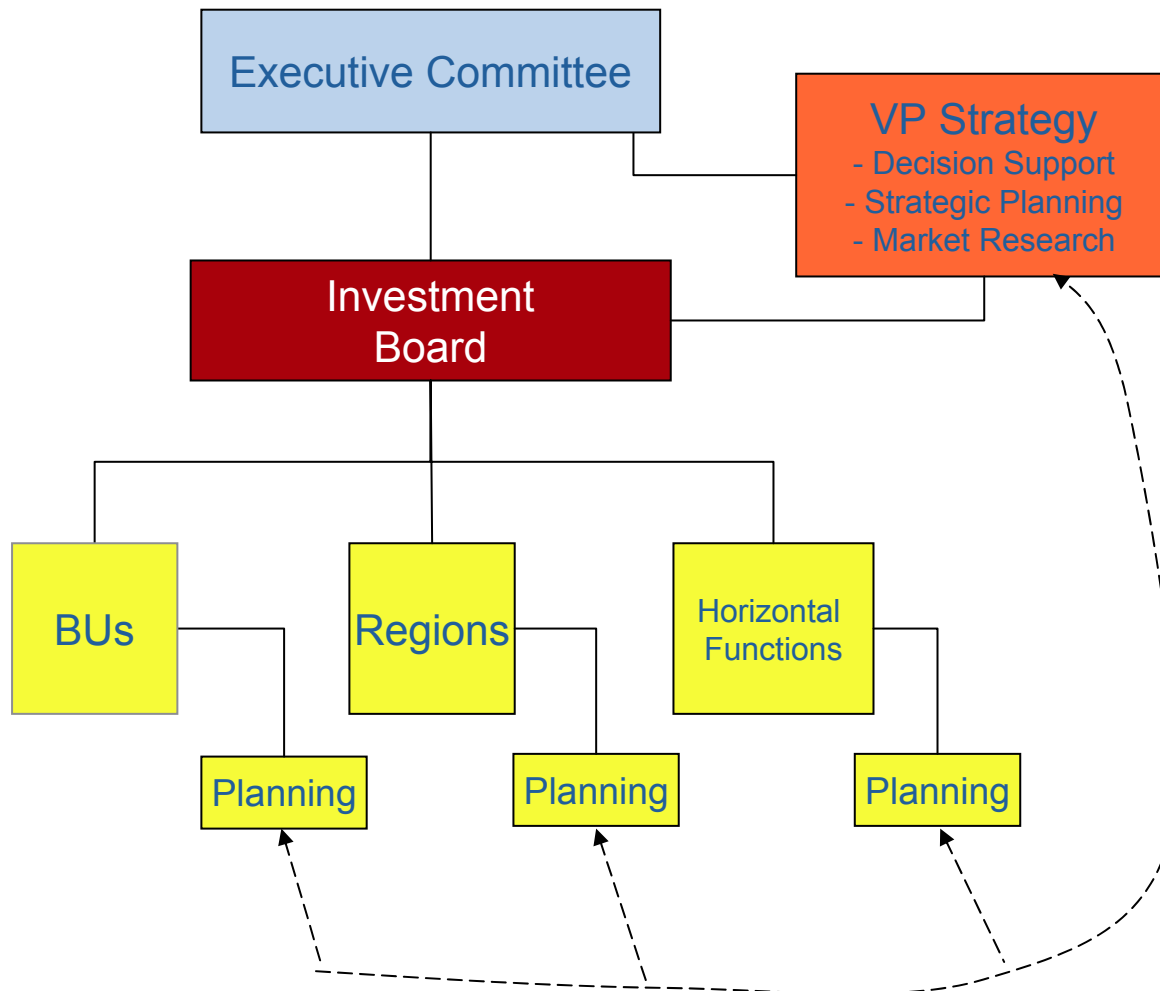
Portfolio of Opportunities and Available Resources

- Clear Criteria
- Sound Decision/Prioritization Process
- Facilitated Strategic Conversations

Portfolio Optimization Decisions

Budgeting

Industry Best Practice Organization Structure for Strategic Planning and Portfolio Management



Investment Board Metrics:

- Corporate Results

Investment Board Role:

- Align Investment With Strategies
- Drive Portfolio of Initiatives
- Set Funding Levels
- Reconcile/Trade-offs
- New Requests Funding (Up/Down)

EIP Strategic Decision Framework



**HP/IPG
Guidelines**

EIP PM design project focus

What markets do we want to compete in and what are the goals?

**EIP Market
Portfolio Planning**

GE/McKinsey type
Scoring Model

Which initiatives do we continue to pursue, stop, add, increase or decrease funding given constrained funds?

**EIP Investment Portfolio
Decision Making (Initiatives)**

Risk/Return
Optimization

Current
state

Future
state

Project Roadmap & Resource Planning

Benefits of portfolio management



- IBM installed its IPD process (core) starting in 1993
 - Over the period 1993-99 they cut development expense by 50%, reduced TTM by 67%, reduced abandoned project expense by 90% and got pipeline loading down near 100%, all while growing revenues (5+%/yr) and profits (20+%/yr)
- IBM installed its EBO process (NBC) starting in 2000
 - By 2002 they had “graduated” 4 new businesses with \$5 B revenue
- When SB first applied portfolio optimization in the early 1990s, they increased portfolio value by 30%, \$2.6 B
- Pfizer has reported improvements of 20%, worth billions
- When Samsung applied PM to \$1 B advertising budget, market share improved in all categories, sales rose 20% in one year and brand value increased 30%
- Chevron used business PM to make a major transformation, shifting investment mix radically, reducing OPEX by \$1 B and tripling stock price

Detailed findings



Our best practices are organized in four groups



- **Senior management philosophy and culture**
 - How does the cultural heritage influence portfolio decisions?
 - What is the mindset and attitude of senior management?
 - What are the right behaviors and conversations for successful PM?
- **Portfolio governance and management incentives**
 - Who makes the portfolio decisions?
 - What incentive structures drive successful portfolio management?
- **Portfolio architecture and business process integration**
 - Levels of PM management and their linkages
 - How does PM relate to Strategic planning, resource allocation etc.?
 - In what order/sequence are the strategic portfolio decisions made?
- **Portfolio management process, methods and tools**
 - Allocating resources across businesses, functions and time horizons
 - Methods for optimization and incremental valuation in PM

Some PM best practices are almost universally accepted by leading companies (1)



- A key objective of PM is to align investment decisions and resources with strategy—strategic alignment
- Another key objective of PM is to maximize return
 - “Clear and factual financial and strategic value drivers are used to prioritize projects within each portfolio and sub-portfolio” (PRTM, SDG, Cooper, Pfizer)
- The PM process must be adequately linked to the processes for strategy development, resource management, forecasting, exec compensation and budgeting—process linkage and alignment
 - “Ensure the business planning process, investment decision process and resource allocation process are coordinated in terms of time, events and people” (Best Practices LLC, SDG, PRTM, McKinsey, Cooper, IBM, Pfizer)
- Employ a standardized PM/Resource Allocation process across all groups—consistency
 - “Standardize language, evaluation criteria, reporting formats and processes”
 - IBM, Motorola, Pfizer, SDG, McKinsey,

Some PM best practices are almost universally accepted by leading companies (2)



- **Governance and decision authority must be defined**
 - “Portfolio priorities set by an executive team with span of control over resources required to execute” PRTM
 - “Ensure appropriate ownership of portfolio management” SDG
 - IBM, Pfizer, Mckinsey, ...
- **Successful PM operates on multiple levels**
 - Strategy, investment decisions and resource allocation (Dow, IBM, Motorola, Pfizer, PRTM, SDG, McKinsey, ...)
- **Measure the value of portfolio decisions** SDG, Pharma, Oil
 - “Credible valuation methodology” SDG
 - “Clear and factual financial and strategic value drivers are used to prioritize projects within each portfolio and sub-portfolio” PRTM

Some PM “best practices” are used by many best practice companies but not all



- Separate corporate strategic PM from BU PM Dow, IBM
- Project priorities are real, i.e. higher priority projects can steal resources from lower priority ones PRTM
- The impact of decisions on one project for other projects is identified, assessed and reconciled PRTM
- Explicit consideration of alternatives as an optimization and value creation approach (SDG, Pfizer, GW, ..)
- Explicit quantitative treatment of risk in evaluating investment decisions and alternatives (SDG, Pharma, Oil)
- Real time and periodic PM (SDG, Lilly,)
- Ensure cross functional linkage through group performance rewards, overlapping responsibilities, integrated planning procedures and office layout

Where HP is going with PM in the future



- We want to elevate PM from a functional resource allocation (RA) process to an *enterprise* RA process
- We want to ensure that strategy, valuation and PM is end-to-end (i.e. from early R&D through to LCM)
- We want to apply portfolio management at all levels, from functions to businesses to total enterprise
- We want to introduce portfolio optimization, both within investment opportunities (strategy optimization) as well as across investment opportunities (portfolio optimization)
- We want to use this to raise our shareholder value and stock price

Current State of Portfolio Management

Current State

- No significant resources earmarked for competing opportunities across HPCo
- Investment resources allocated to Groups based on historical financials, investment multiples and 3-year profitability goals
- Unclear ownership-assignment and funding vehicle for white space and horizontal opportunities
- Inconsistent approach to business case development and evaluation for white space and horizontal opportunities
- Inconsistent review process
- No common selection & prioritization decision process across the portfolio of proposals
- Opportunities requiring >6 months investment impacted by ASPIRE resulting in on again/off again investment ineffectiveness.
- No framework to evaluate the role & relative contribution of each core business.
- Don't explicitly identify cash generators and the growth engines in the core portfolio
- Don't set financial improvement goals by business in context of the portfolio
- Don't make decisions to exit underperforming businesses
- Don't have a method to evaluate and select the best new growth opportunities
- Need a process to identify investments necessary to support core business as well as growth
- Considering affordability a way to trade-off all the investments proposals across the company
- Funding firewalled for new business has to be rationalized at the time of ASPIRE planning

Desired State of Portfolio Management

End State

- Investment opportunities evaluated objectively as a portfolio and consistently within a rigorous process linked to the strategic planning, budgeting and performance management processes
- Investment opportunities prioritized objectively based on corporate strategy priorities
- EC committed to promoting healthy competition, across HPCo, for investment resources
- Clear ownership and accountability to pursue investments across/outside Groups
- Funding available and protected for competing investments across HPCo
- Manage an investment over several years, not just year-to-year
- Consistent tracking of all approved opportunities

“How can an enterprise best allocate limited resources to optimize economic returns and to best meet business objectives?”

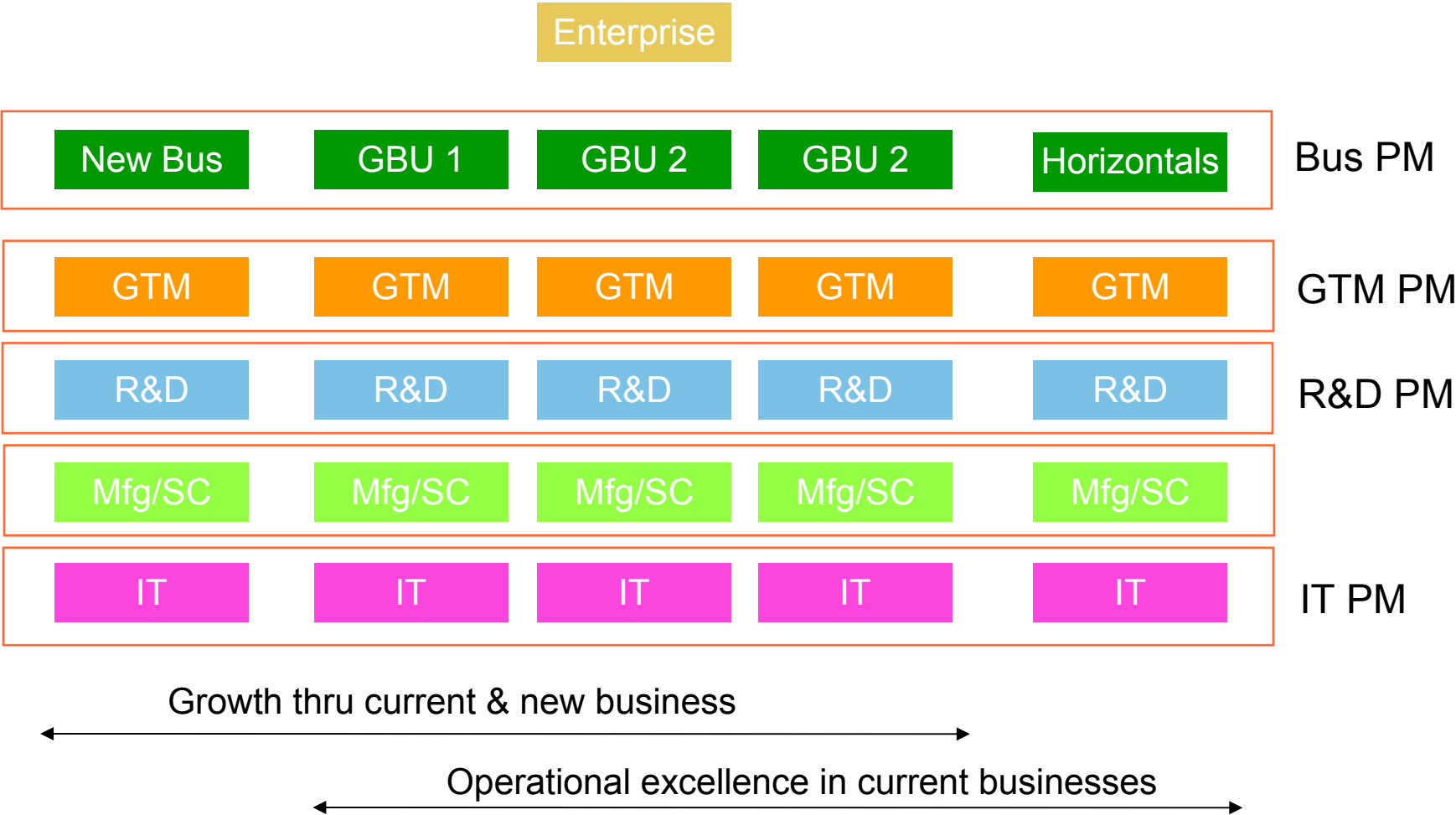
71 High Performing Companies

So what is **Enterprise** Portfolio Management?

Enterprise-wide Portfolio Management



Pure Horizontal View

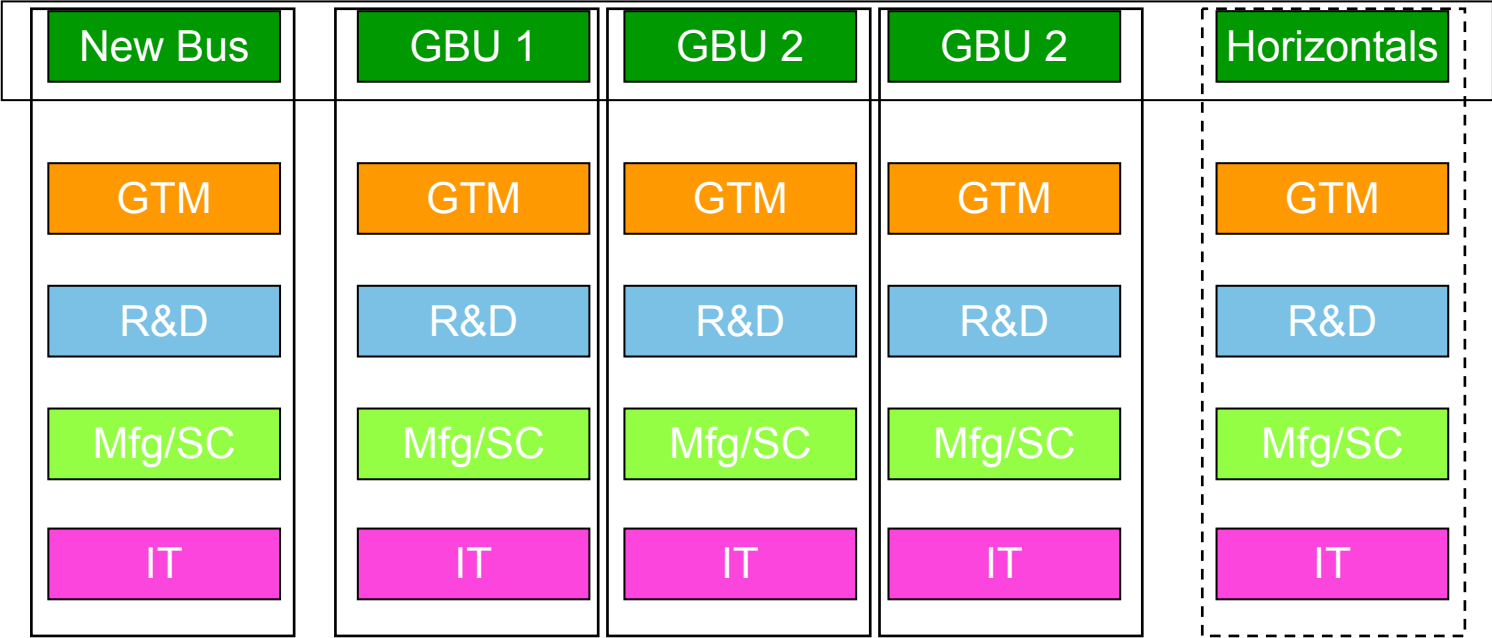


Enterprise-wide Portfolio Management

Pure Vertical View

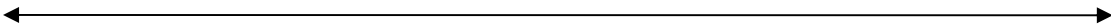


Enterprise

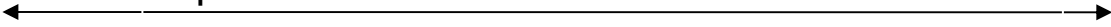


Bus PM

Growth thru current & new business

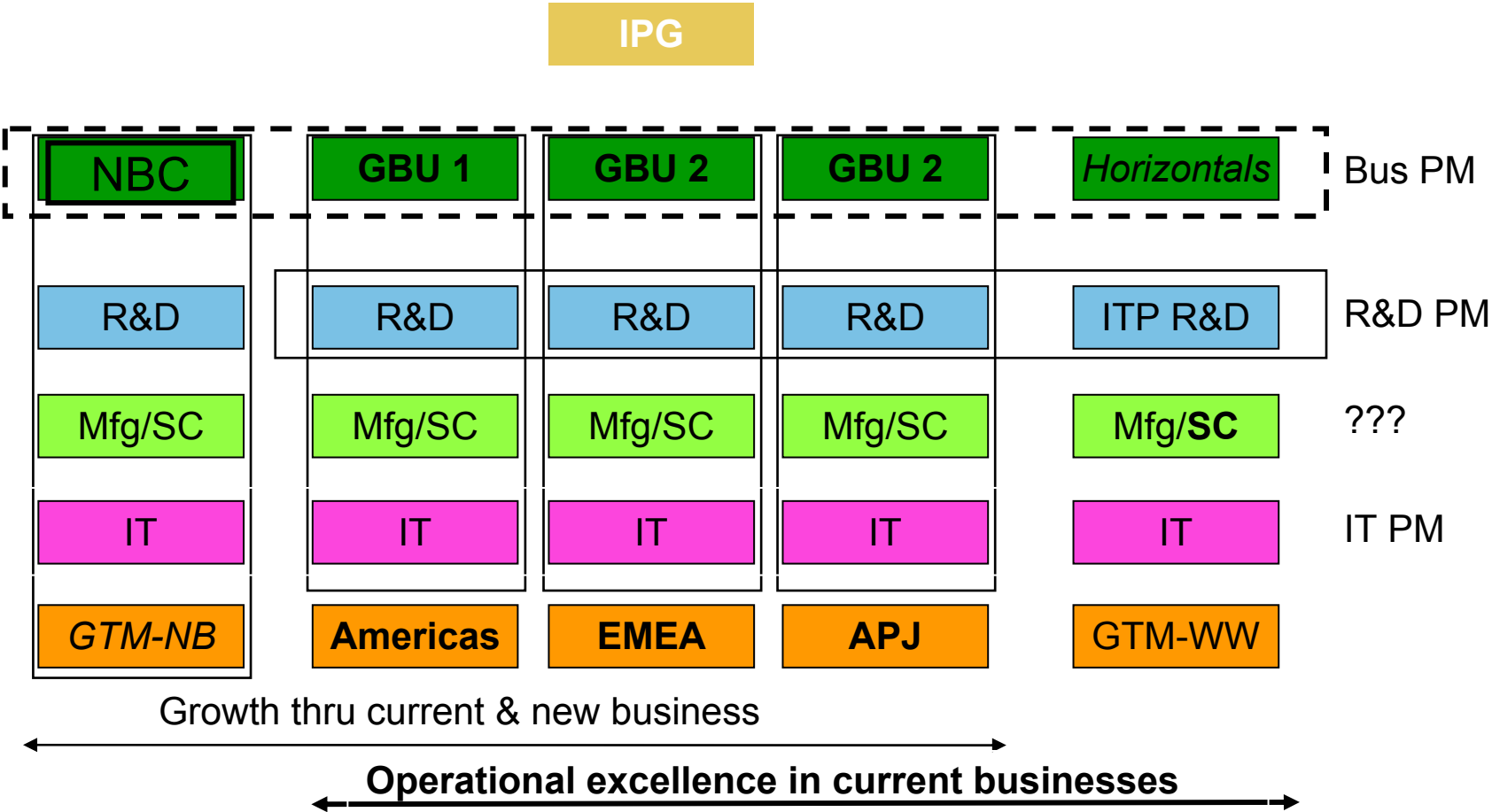


Operational excellence in current businesses



Enterprise-wide Portfolio Management

IPG current situation—my interpretation

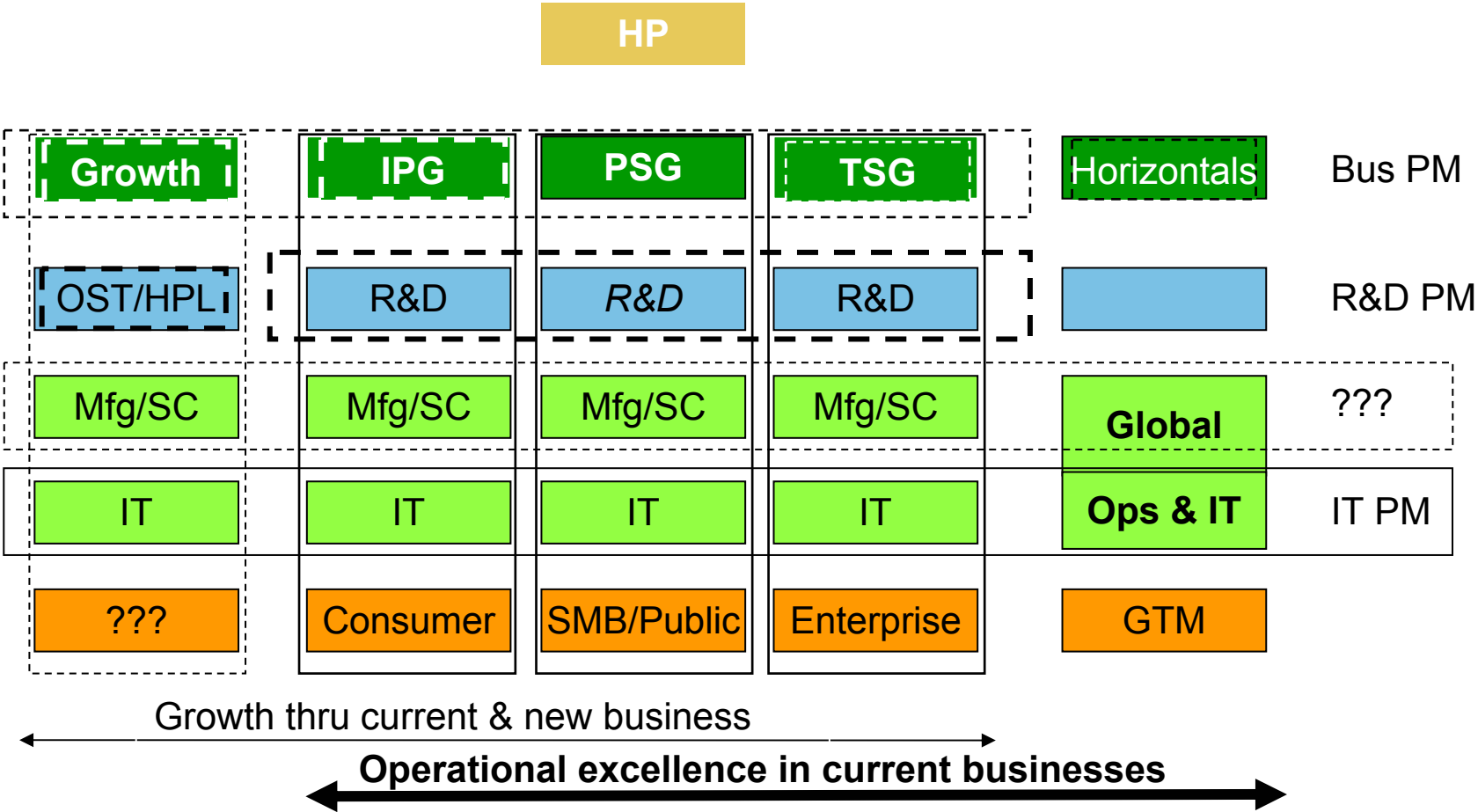


- GBU, Mfg. & R&D aligned; GTM is regional; SC by “pipe”; IT corporate-wide
- GBUs have the P&L; substantial corporate allocations not controlled by IPG

Enterprise-wide Portfolio Management



HP current situation—my interpretation



- GBU, Mfg. & R&D aligned; GTM is regional; SC by “pipe”; IT corporate-wide
- GBUs have the P&L; substantial corporate allocations to Sectors for horizontal expenses

A new group is forming to work on Enterprise PM issues, process and practices



- Enterprise Portfolio Management Council
- Charter members—AAA, Boeing, ChevronTexaco, HP, Port of Portland, Safeway, VISA, Washington Mutual
- We would welcome additional organizations interested in expanding portfolio management to optimize the entire enterprise resource allocation for the purpose of enhancing shareholder value
- Next meeting May 19 at Washington Mutual, Seattle
- For information call
 - Michael Menke, HP, 650-365-4971
 - Mark Stabler, CSAA, 415-934-3619
 - Or visit <http://www.portfoliomanagementcouncil.org>

PM culture, mindset and behavior of best practice companies



Portfolio Management culture, mindset and behavior of best practice companies



- Portfolio management is done to improve corporate performance and create shareholder value McKinsey, SDG
- PM only matters if it improves performance through improved decision-making that drives action Lilly
- The three main objectives of PM are: APQC-Cooper
 - Strategic Alignment
 - Maximizing Return
 - Portfolio Balance
- Effective PM depends on solid data-driven analyses and decisions Lilly, Pfizer, McKinsey, PRTM, SDG
 - “Clear and factual financial and strategic value drivers are used to prioritize projects within each portfolio and sub-portfolio” PRTM
- Measure the value of portfolio decisions SDG, Pharma, Oil
 - “Credible valuation methodology” SDG

Portfolio Management culture, mindset and behavior of best practice companies (2)



- “Unshakeable leadership commitment is critical to PM success” Motorola, Pfizer
- Top management should be process champions (or at the very least strong believers in the value of process)
 - IBM (Gerstner—ex-McKinsey), Pfizer (McKinnell—PhD. Economist), Motorola, DuPont and Dow (6 sigma)
- Portfolio management is inherently cross-functional and cross-business Bain, IBM, McKinsey, Pharma, PRTM
 - “Portfolio priorities set by an executive team with span of control over resources required to execute” PRTM
- Appropriate behavior of line and functional managers in their portfolio decision-making role requires adopting a corporate/shareholder viewpoint IBM, Pfizer, McKinsey
 - Pfizer has 110 people in their NPD group dedicated to providing objective expert process support devoted to enhancing shareholder value

PM governance and compensation practices of best practice companies



PM governance and compensation practices of best practice companies



- **Governance and decision authority must be defined**
 - “Ensure appropriate ownership of portfolio management” SDG
 - “Portfolio priorities set by an executive team with span of control over resources required to execute” PRTM
 - IBM, Pfizer, Mckinsey, ...
- **Project priorities are real, i.e. higher priority projects can steal resources from lower priority ones** DuPont, Lilly, PRTM
- **All 9 of the companies benchmarked by SDG have some form of Strategic Planning Council (SPC)**
 - The SPC is the group of senior managers who form the key strategy and decision-making team and play a key role in setting the strategic agenda
 - The SPC usually includes the CEO, COO and CFO, plus often the heads of the major businesses; the head of corporate planning is usually the SPC secretary
 - In companies such as Kodak in need of major transformation the SPC may not include the BU heads, who have more of a vested interest in the status quo
 - In many companies, intermediate decision bodies exist between the SPC and the BUs to deal with strategic initiatives (Pfizer, Bain, McKinsey); in these situations the strategic initiatives’ resource needs take priority over the BU decisions

- PRTM Pace structure

PM governance and compensation practices of best practice companies



- The PM process must be adequately linked to the processes for strategy development, resource management, forecasting, executive compensation and budgeting—process linkage and alignment
- Part of Pfizer’s line management compensation depends on the alignment of their behavior in their portfolio decision-making role with shareholder value creation (not just short term results or what’s best for their BU)
 - This is evaluated by Pfizer’s top management
- IBM uses Enterprise-Oriented Incentives for EBOs
 - BU heads’ entire bonus is based on corporate performance, reducing temptation to sacrifice EBO resources for parochial reasons
- Ensure cross functional linkage through group performance rewards, overlapping responsibilities, integrated planning procedures and office layout

Portfolio architecture and business process integration



- **Successful PM operates on multiple levels**
 - Strategy, investment decisions and resource allocation (Dow, IBM, Lilly, Motorola, Pfizer, McKinsey, PRTM, SDG, ...)
- **The PM process must be adequately linked to the processes for strategy development, resource management, forecasting, exec compensation and budgeting—process linkage and alignment**
 - “Ensure the business planning process, investment decision process and resource allocation process are coordinated in terms of time, events and people” (IBM, Pfizer, Best Practices LLC, Cooper, PRTM, McKinsey, SDG)

IBM core development process (IPD)



- IBM designed and implemented its IPD model over 1993-1999
 - The goal was to take ~\$3 B out of HW+SW development
- Integrated Product Development is hierarchical:
 - Integrated Portfolio Management Team; Strategy & Plans Team; Pipeline Management Team; Lifecycle Management Team
- IPD yielded major productivity improvements:
 - HW and SW development expense—down 50%
 - HW development TTM—reduced 67%
 - Abandoned project expense—down 90%
 - Warranty expense—down 25%
 - Pipeline loading—near 100% (down from 150-200%)
- Revenues, profits and share price grew sharply over this period
 - Revenue declined 3.1%/yr 1990-93, but grew 5.7%/yr 1993-99
 - Profit was negative in 1991-3, but grew 20.7%/yr 1994-99
 - Stock price grew about 40%/yr 1994-99

Dow uses PM on many levels



- **Corporate Portfolio management—Executive level**
 - Growth areas; Strategic Initiatives; Long-term/short-term tradeoffs
- **Business Group PM—collection of businesses**
 - 3-5 years goals and major initiatives
- **Business PM—focused business activity**
 - Annual goals
- **Functional PM—program management**
 - R&D, IT, etc.
- **Platform Portfolio Management**
 - Market focus; Growth focus; Geography focus
- **Project PM—groups of specific projects**
- **Corporate PM group is small (5-6) but sets standards for portfolio managers in the sectors and businesses**
 - A lot of attention is paid to linkages and alignment across these levels

McKinsey recommends creating a corporate “portfolio of initiatives” to drive value creation



- McKinsey finds that many companies attempt to boost earnings by cutting discretionary spending so much that potentially productive LT investments are compromised
 - “Managers often can’t use their judgment to make ‘no-brainer’ decisions that could yield important performance gains”
 - “Line managers often lack the freedom to spend money unless they seem likely to recover the investment during the current year”
- To drive corporate performance McKinsey recommends
 - Line and top management should be made collectively accountable for the trade-offs between ST performance and LT discretionary spending and talent investments for major new initiatives
 - At the heart of their approach is the development and management of a corporate “portfolio of initiatives” that can drive LT performance
 - All activities that could have a material impact on a company’s market cap become part of the process, typically 20-40 initiatives
 - To make the approach work a company must carve out a discrete corporate performance budget and oversee it with a PMO

- McKinsey recommends the BASICS framework for turning the concept of corporate performance into an operational reality
 - **B**uild new businesses
 - **A**dapt the core
 - **S**hape the portfolio and ownership structure
 - **I**nspire performance and control risk
 - **C**ommunicate corporate strategy and values
 - **S**et the pace of change
- Dow, IBM and Intel are companies that are using a portfolio of initiatives to boost corporate performance
 - HP's five horizontal initiatives would also fall into this category
 - Bain also gave several other examples of high-tech companies using a similar approach to drive corporate initiatives

- IBM's EBO program was created to overcome slow execution on New Business Opportunities. Root causes:
 - Rewards directed at short-term results
 - Emphasizing profit and EPS over P/E impact
 - Preoccupation with current customers and offerings
 - Lack of disciplines for selecting, funding and terminating new growth business
 - Insufficient senior management attention to new sources of LT growth
- In Q3 2000 Gerstner appointed a new vice-chairman to drive the EBO program
- EBO categories:
 - New Markets—extending existing offerings to new segments
 - New offerings—integrating current/new products & services to create new VP
 - New Technologies—innovations that disrupt or redefine markets
- EBO selection criteria:
 - Strategic importance and financial potential (\$1 B revenue in 3-5 years)

- **EBO organizational model:**
 - Each EBO is housed within the BU that provides the strongest connections to technical talent, managerial resources and customer relationships
 - Strategist and host-division SVP resolve disputes between contributing BUs regarding EBO plans and resource allocation
 - EBO leaders are “A-team” leaders; most are members of IBM’s 300 member senior leadership team
- **How IBM counteracts near-term pressures**
 - Group executive sponsorship—Head of host division meets monthly with EBO project leaders and SVP strategy to track progress and eliminate roadblocks
 - Enterprise-oriented incentives—BU head’s entire bonus is based on corporate performance, reducing temptation to sacrifice EBO resources for parochial reasons
 - SVP strategy can intervene with BU if committed funding for EBO is not there
- **Results**
 - In 2002, four EBO “graduates”—Life Sciences, Linux, Pervasive Computing and Engineering & Technology Services—contributed \$5 B in new revenue to IBM

Nokia has a well-defined process for NBD



- Nokia has a single oversight committee, the New Business Development Board, in which all innovation groups are represented that is empowered to allocate *staff* and funding to new business ideas, and to transfer projects across organizational boundaries
 - The NBD Board involves comprehensive oversight, inclusive decision making, diverse inputs and frequent reviews
 - The group employs a set of clearly defined decision rules for regular project evaluation and placement. Criteria include:
 - Relatedness test—closely related-core; loosely related to NVO
 - Strategic potential test—Uncertain potential to Early-stage TF
 - Viability test—if poor viability – shut down
 - Core business fit test—poor fit to core – to ownership test
 - Ownership fit test—if different owner would add more value divest

PM Process, Methods and Tools



Best practice companies use a consistent standardized PM and RA process



- IBM

- Integrated Product Development process: Integrated Portfolio Management Team; Strategy & Plans Team; Pipeline Management Team; Lifecycle Management Team

- Motorola

- M-Gates: Every business, every function use exact same roadmap process
- **Common** Project Metrics Dashboards, common risk management process, common project scheduling tool, common language across multiple global design and management teams
- Prioritization & Allocation Process; Integrated Resource Management System

- Pfizer

- Common project and portfolio analysis provided by objective central NPD support group with commercial assessment, decision analysis and PM skills

- PRTM

- PACE Process (Product and Cycle Time Excellence) is used by scores of companies

Benchmark data underscores the importance of standardizing the PM/RA process



- Findings from the Best Practices LLC study of 14 highly respected companies:
 - More than 50% of the 14 companies rated three approaches—process standardization, standard definitions and standard evaluation tools as “critical”
 - Standardized RA documentation and standardized charts & formats were close behind with 46% each
 - 73% of the companies concurrently employ 5 or more standardization approaches in an effort to ensure quality and consistency in the RA process business units

- We did not hear much about BCG/GE matrix processes for Business Portfolio Management although they are surely used to develop insights during the strategic planning process of many companies
- SDG has used its Business Portfolio Strategy Process to do cross-BU portfolio management and high-level resource allocation for a number of clients
 - This tends not to be an annual planning process, but rather every 2-5 years
- The oil exploration and production industry makes extensive use of decision analysis to compare business opportunities across geographies and BUs
 - Chevron adopted the SDG Decision Dialogue Process as their internal strategy development process and used it to great effect
- Boeing's 7E7 program uses PM extensively

There is some evidence for enterprise-wide PM

- Ford Financial use an enterprise-wide project portfolio management system to accelerate the development of high-priority growth projects
- The Corporate Strategy Board recommends an enterprise-wide system for growth projects involving:
 - Standardized project assessment templates
 - An enterprise-wide growth project tracing system
 - A comprehensive decision-making body that coordinates prioritization and funding for all projects, regardless of where they are initiated
 - A cross-portfolio prioritization and consolidation process that can accelerate the progress of “breakthrough” opportunities by shutting down incremental projects and combining similar initiatives
 - An alternative prioritization analysis capability
 - Frequent reprioritization reviews

A number of organizations are using a “portfolio of initiatives” to drive value creation



- Dow Chemical’s corporate portfolio process includes a step explicitly considering a portfolio of strategic initiatives to which BU strategies must respond
- IBM’s EBO process again is designed to create and manage a portfolio of new growth opportunities
- To drive corporate performance McKinsey recommends
 - The development and management of a corporate “portfolio of initiatives” that can drive LT performance
 - All activities that could have a material impact on a company’s market cap become part of the process, typically 20-40 initiatives
 - To make the approach work a company must carve out a discrete corporate performance budget and oversee it with a PMO
 - These initiatives exist separately from the internal portfolios of the business units
- Bain also observed that initiative portfolios exist in well-managed companies such as Intel and Vodaphone

- We did not find evidence that explicit PM processes and methods are widely used to allocate resources *across* major business functions such as R&D, GTM and IT
- The SDG business portfolio strategy process deals with cross-functional resource allocation, but it is not typically used as an annual planning process
- Many companies are taking steps in this direction by using common metrics such as NPV and ROI to evaluate all categories of business investments, not just R&D and capital investment
 - Intel among others believes strongly in quantitatively assessing the business value of IT initiatives

- Formal portfolio management processes are widely used in R&D and often include portfolio optimization
- They also often are based on decision analysis (DA) to accommodate risk and uncertainty
- Pharma industry, e.g. Pfizer, GSK, Lilly, is probably the most advanced industry in using R&D portfolio management
 - Pfizer has a large (100+) New Product Development Group, with of PM and DA experts plus experts in early and late-stage commercial analysis
 - This group is objective and independent of both R&D and commercial ops.
 - Each major development project has a strategy developed to optimize the value of the underlying technology asset
 - The evaluations are done with decision analysis to deal with the inherent risk in pharmaceutical R&D
 - Lilly has advanced from periodic PM to real time PM, so they are able to efficiently update the full portfolio whenever a new opportunity arises

- We found substantial evidence for explicit financial portfolio management approaches to allocating GTM resources for maximum return
- Accenture has developed a Strategic Prioritization Methodology and applied it to maximize marketing ROI in over 200 assignments, several very much like IPG
 - E.g. Accenture worked with Samsung to optimize the expenditure of a \$1 B WW marketing budget, made significant reallocations and got great results
- SDG has applied its portfolio analysis approach to optimize portfolios of brand advertising and channel investments Consumer Packaged Goods, Pharmaceuticals
- A benchmarking report from APQC also confirms widespread use of Marketing Mix Models to maximize Marketing ROI—AT&T, Colgate, Kraft, Minute Maid case studies

- Portfolio management is now in widespread use in IT
- Intel is a leader in valuing IT projects
- SBC Services example
- H&R Block example

- In investment and R&D portfolios, the use of project strategy alternatives for return optimization is widespread in the pharma and E&P industries
 - Amoco, Chevron, Lilly, GSK, Pfizer, Shell
- Coupling marketing mix models with financial models shows a similar trend in top marketing companies
- SDG benchmarking of 9 large companies showed that alternatives were used in strategy development by all
 - 2 used full decision and risk analysis to evaluate the strategy alternatives
 - 2 used deterministic analysis on all, plus some risk quantification
 - 5 defined strategy alternatives, but focused their financial analysis on just one “middle of the road” strategy
- The Boeing 7E7 program is being managed with extensive probabilistic analysis of alternatives

- In investment R&D portfolios, the use of Decision Analysis is very widespread in pharma and E&P where risk is a critical element of potential opportunities
 - Amoco, Chevron, Lilly, GSK, Pfizer, Shell
- Decision analysis is also widely used in PM across a wide range of other industries
 - AT&T, Boeing, Dow, DuPont, IBM, McKinsey, SDG, Weyerhaeuser
- Decision & risk analysis is an integral part of the IBM Deep Dive process used to evaluate its portfolio of emerging business opportunities
 - Note—IBM's use of the term Deep Dive is much more precisely defined and rigorous than any of the “deep dive” manifestations at HP!
- Other methods for dealing with risk include real options, scenario analysis and real options/DA hybrids Shell

Value metrics for portfolio management and resource allocation



- “Use clear and factual financial and strategic value drivers to prioritize projects within each portfolio and sub-portfolio” PRTM
- Net Present Value and Expected Net Present Value are the most commonly used metrics (McKinsey, SDG, BP LLC)
 - These are metrics based on incremental cash flow that link closely to shareholder value
 - They are completely consistent with EVA
- Findings of Best Practices LLC benchmarking study:
 - NPV (79%) and ROI (64%) are the most common in companies’ “top three” metrics
 - EVA (56%), Payback Period (46%) and IRR (43%) come next.
 - “Employ multiple quantitative measures by which to evaluate resource allocation requests” Best Practices LLC
 - 13 of 14 benchmark companies used 4 or more financial metrics

Appendix—Company Findings



IBM core development process (IPD)



- IBM developed its IPD model over 1993-1999
 - The goal was to take ~\$3 B out of HW+SW development
- Integrated Product Development is hierarchical:
 - Integrated Portfolio Management Team; Strategy & Plans Team; Pipeline Management Team; Lifecycle Management Team
- Some process results:
 - HW and SW development expense—down 50%
 - HW development TTM—reduced 67%
 - Abandoned project expense—down 90%
 - Warranty expense—down 25%
 - Part numbers—down 34%
 - Pipeline loading—near 100% (down from 150-200%)
- Revenues, profits and share price grew sharply over this period
 - Revenue declined 3.1%/yr 1990-93, but grew 5.7%/yr 1993-99
 - Profit was negative in 1991-3, but grew 20.7%/yr 1994-99
 - Stock price grew about 40%/yr 1994-99

- Samsung spends nearly \$1 B/year on CE advertising
- Goal: move up to compete with market leader Sony
- Accenture helped Samsung analyze 14 product categories in 34 geographic regions with its Strategic Marketing Prioritization process
 - An 18 month effort with global teams
 - Found serious funding, pricing and innovation imbalances
 - Reallocated \$150 from more mature categories and regions to those that offered significant untapped potential
- Results
 - Improved market share and rank in mobile phones, camcorders, flat panel monitors, DVDs, digital TV, MP3, LCD TVs etc.
 - Improved brand value 30% to \$8.3 B, from 42nd to 34th place
 - CE sales rose 25% between 2001 and 2002 and net income increased from \$5.1 to \$6 B

- Chevron used its custom version of the SDG Dialogue Decision Process to effect a major corporate portfolio transformation over the period 1991-1996
- The goal was to improve company competitiveness and shareholder return
- Some business results:
 - Domestic E&P reduced OPEX/CAPEX by \$1 billion
 - E&P mix shifted from predominately domestic to international
- While growing revenues and profits over the same period

- SmithKline Beecham reported an increase in their R&D portfolio value of 30%, worth \$2.6 billion as a result of their first full round of portfolio optimization
 - This came from two effects, first better selection and prioritization of projects and project strategies and second management's decision to increase the R&D budget when they realized how much value there was in the portfolio
- Pfizer verbally suggested an improvement of 20%+, equivalent to a “savings” of \$1.4 billion on a \$7 billion R&D budget and likely \$7 to \$14 billion of shareholder value increase
 - Pfizer also uses project/portfolio optimization to create value
- Similar portfolio optimization methods are in place in most large pharma R&D organizations

- In the 90s, 2 major acquisitions changed the asset mix and risk profile of BNR's portfolio
 - The risk and uncertainty in the newly acquired properties could not be assessed using the traditional BNR rules-of-thumb
- They looked at several portfolio consultants (including Pete Rose and Ed Capen) based on Decision Quality and D&RA to deal with the increased E&P risk
 - Sophisticated risk analysis was new to most of the units, including some of the risky ones—needed a uniform process corporate-wide
- Implementation hurdle—viewing the total corporate portfolio and not just individual BU portfolios
 - Created a corporate Exploration Decision Board to look across all divisions for uniform assumptions and process
 - Since this was intrusive to the divisions, they eventually went to an organization solution of a WW Exploration unit, with dotted lines to the regional divisions

- Capability development
 - SDG built a portfolio tool for planning and budgeting that could integrate the results from approx 200 “Natural Business Areas”
 - BNR continues to use the tool and the process on an annual basis
- They looked at several portfolio consultants (including Pete Rose and Ed Capen) based on Decision Quality and D&RA to deal with the increased E&P risk
 - Sophisticated risk analysis was new to most of the units, including some of the risky ones—needed a uniform process corporate-wide
- Implementation hurdle—viewing the total corporate portfolio and not just individual BU portfolios
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Evolution of R&D management practice



- **General** (from *Next Gen Product Development*, Michael E. McGrath)
 - Invention and Commercialization Generation—1890-1950
 - Project success Generation—1950-1985
 - TTM Generation—1985-2000 (including periodic portfolio & pipeline mgt.)
 - Driven by need for speed; time-based competition (BCG); ...
 - R&D Productivity Generation—2000+ (including comprehensive resource mgt and integrated portfolio and product strategy)
 - Driven by the need to do more with less do to global competition and margin squeeze
- **Pharma**
 - XYZ Research Institute—discovery a random search process
 - Project management in R&D (begins 1950s/60s)
 - Driven by new regulatory, safety and quality control requirements
 - Rudimentary marketing input (begins mid 1970s)
 - Driven by increasing cost of development (ever larger and more complex clinical trials)
 - Strategic marketing & portfolio management in development (begins mid 80s)
 - Driven by increasing cost and competition, plus wealth of new targets from biology
 - Portfolio optimization (begins early 1990s in expensive late-stage development projects)
 - Driven by the need for increasing shareholder value
 - Comprehensive portfolio management (begins ~2000; extend for additional gains)

Sequence of initial activities at Pfizer



- 1983—Hank McKinnell, VP Corp Strategy attends DA seminar
 - Follow up discussions on use of DA for risky acquisitions (e.g. Searle/NutraSweet)
- 1984—Craig Saxton, VP Medical Pfizer Int. attends talk on portfolio management at suggestion of head statistician
 - 1985/6 Internal DA seminar; pilot project on 3 Pfizer Int. development projects
- 1987/8—Craig promoted to WW head of development in CR&D
 - Internal DA seminar for key R&D managers in Central Research
- 1990/1—Craig sends UK manager to DA seminar
- 1992/3—several of most important development projects get strategic DA; important learnings and surprises
- 1994—SDG audit of Pfizer “portfolio process”
 - McKinnell now CFO; periodic marketing visits sustain his interest in better PM
- 1995—First full application of SDG PM across late stage development portfolio; effort very successful
 - McKinnell (CFO) agrees to pay multi-million cost of consulting
 - Pfizer fails to assign resources to learn process from consultant for self-sufficiency



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