

Abstract

Technology management is still a young discipline of management. Its rapid emergence in entrepreneurial practice and academia has been observed for decades since the time when technology and innovation were perceived as constituting major factors of organizational competitiveness and viability. Given the myriad of technology applications in products, services, systems and processes in companies having largely different purposes, the practiced and scholarly approaches to technology management vary widely. Nevertheless, basic patterns of technology management and its methodological content can be distinguished. Moreover, as a result of the greater impacts of societal and technological change, an evolutionary development of the scope of technology management over time can be observed. This aspect constitutes the core sweet of this Technology and Innovation Management on the Move - From Managing Technology to Managing Innovation-driven Enterprises'. After a short introduction to the problem of the lacking technology awareness in general management, the concept of the Integrated Technology and Innovation Management will be presented. Hence, numerous processes, structures and methods will be explored in detail for each of the main tasks of the Integrated Technology and Innovation Management, including: I. Identification & Selection, II. Development & Acquisition, III. Exploitation & Protection, IV. Control, as well as two additional aspects; V. Technology Innovation and VI. Technology and Innovation Management in SME/NTBF. The focus lies on applied solutions and management principles that are of practical use for management.

The authors represent a broad variety of science and practice. This - book is written for managers and students of management science and in particular those interested in technology and innovation management.

Inhalt

*TECHNOLOGICAL AWARENESS: THE TECHNOLOGY AWARENESS GAP IN GENERAL MANAGEMENT: Technology-Omnipresent Reality of Achievements and Threats - The technology management paradox - Moreover: Europe's Performance Gap - Facing the Two Gaps: What is Next? - A Longterm Perspective: The Concept Enterprise Science - THE DIFFICULTIES IN MANAGING DISCONTINUOUS TECHNOLOGY CHANGE: Two Pattern of Technology Change - Discontinuous Technological Change: The Case of the Photography Industry - The Main Reasons for the Difficulties Managing Discontinuous Technological Change: Industry blindness - Managerial uncertainties - Next Steps

THE CONCEPT OF THE INTEGRATED TECHNOLOGY AND INNOVATION MANAGEMENT: THE CONCEPT OF INTEGRATED TECHNOLOGY AND INNOVATION MANAGEMENT: Bringing Technology into Management: The Call from Reality - General Management Concept Open for Technology Issues - Symbiotic Connection Between Managing Technology and Managing Innovation - Management-Conscious Understanding of Technology - Technology-Conscious Tools of General Management - A Model Case of Technology and Innovation Management

TASKS OF INTEGRATED TECHNOLOGY AND INNOVATION MANAGEMENT: IDENTIFICATION & SELECTION - TECHNOLOGY INTELLIGENCE - IMPROVING TECHNOLOGICAL DECISION-MAKING: The Technology Intelligence Process: Determination of information needs - Information acquisition - Information analysis - Information communication - Organization of the Technology Intelligence Process: Different technology intelligence structures - Company examples of the organization of the technology intelligence process - Conclusion - TECHNOLOGY ROADMAPPING - A METHOD FOR TECHNOLOGY PLANNING: Technology Roadmapping: A Beneficial Approach - An Integrated Approach to Technology Roadmapping - Implementation of Technology Roadmapping: Best conditions for initiating the implementation - Implementation team - Implementation procedures - EVALUATING AND INTRODUCING DISRUPTIVE TECHNOLOGIES: A Framework for Investigating the Evaluation and Introduction of Disruptive Technologies - The Practice of Evaluating and Introducing Nanotechnology in Switzerland: Initiation of technology evaluation - Technology scanning and monitoring - Technology valuation - Technology selection - Technology implementation - Management Principles for Evaluating and Introducing Disruptive Technologies: Technology scanning - Environmental scanning - Kickoff to technology evaluation - Technology evaluation - Technology selec-

tion - Technology introduction

DEVELOPMENT & ACQUISITION: TECHNOLOGY TRANSFER - AN ACTION AND TECHNOLOGY PERSPECTIVE: The Importance of Knowledge and Technology Transfer - The Process of Transferring Knowledge: Transferring data, information, and knowledge - Constitutive elements of technology transfer - Object of technology transfer: Knowledge - Recipient of technological knowledge - Drafting the technology transfer process - Developing an Action-Oriented Model of a Technology Transfer Process: Modeling - Coaching - Scaffolding and fading - Reflection - Exploration - Conclusions DEVELOPING TECHNOLOGICAL CORE COMPETENCIES - FRAMEWORK AND APPLICATION: The Quest for Competitive Advantage: Insight from the Resource-Based View - Developing a Framework for the Development of (Technological) Core Competences: Development of cognitive advantage - Transformation: From idea to competence - Influencing market and competitor reaction - Realization of core competence's value - Case Study: New Technology-Based Firms (NTBF): Development of cognitive advantage - Transformation from idea to competence - Influencing market and competitor reaction - TECHNOLOGY SOURCING VIA ACQUISITIONS-AN INTEGRATED TECHNOLOGY DUE DILIGENCE-PROCESS: Major Pitfalls in Technology-Intensive Acquisitions: Lack of appropriate pre-conditions - Inappropriate process design - Inappropriate integration approach and management - Lack of appropriate methodological competencies - Conceptual Framework: Outlook for an Integrated Technology Due Diligence - COMPETENCE MANAGEMENT WITH THE OPPORTUNITY LANDSCAPE: Plan the Knowledge for Tomorrow - Today - The Opportunity Landscape: Definition of relevant and potential knowledge domains - Definition of the observation depth - Visualization of the Opportunity Landscape - Definition of the gatekeepers - Gatekeeper tasks and communication - Derivation of actions and updating - Implementation of the Opportunity Landscape - Two Case Studies: Institut Straumann AG - Roche Instrument Center - Conclusion

EXPLOITATION & PROTECTION: EXTERNAL DEPLOYMENT OF TECHNOLOGIES: Strategic Implications of External Technology Deployment: Reference framework - External technology deployment: opportunities and threats - The implication of technology characteristics - Marketing Instruments in Technology Markets: Objects of transfer - Communication channels - Mechanisms of earnings - Distribution channels - External Technology Deployment Success Factors - DESIGN AND IMPLEMENTATION OF TECHNOLOGY MARKETING ORGANIZATIONS: Main Issues of Technology Marketing - The Basic Tasks of Technology Marketing - The Technology Marketing Organization as a Socio-technical System - The Introduction of a New IP-

Management System at Unaxis (Example 1) - The Organization of Licensing and Spin-off Businesses at Siemens AG (Example 2) - Discussion of the Two Examples - Implications for the Design and Implementation of Technology Marketing Organization

PATENT VALUATION-HOW THE MONETARY VALUE OF PATENTS CAN BE CALCULATED: The Importance of Patents in the Firms' Innovation Process - The Difficulty of Valuing Intellectual Property - Measuring the Value of Patents - Developing a DCF-Based Patent Valuation Methodology: Step 1: Technology-patent/product-matrix - Step 2: Calculating free cash-flows - Step 3: Key purchasing criteria (KPC) - Step 4: Key technologies, key patents - Step 5: Patent protection factor (PPF) analysis - Step 6: Calculating patent value - Conclusion

CONTROL: SUCCESSFULLY IMPLEMENTING THE TECHNOLOGY STRATEGY: Design of a Technology Management Control System: Diagnostic technology control system - Interactive technology control system - Technology beliefs and boundary systems - A system for controlling technology strategy and performance - Practical Solutions Based on a Technology Management Control System: Infineon Technologies - Action research at Infineon: Technology performance measurement - Verifying the TMCS on the Basis of the Solution: Diagnostic technology control system - Interactive technology control system - Technology beliefs and boundary systems - Conclusion

TECHNOLOGY INNOVATION: MANAGING THE EARLY PHASES OF THE RADICAL INNOVATION PROCESS: Changing Attitudes Towards the Importance of Radical Innovations - Different Approaches to Managing the Early Phases of Radical Innovations - A Process View of the Early Phases of Radical Innovations - Managerial Implications - Conclusion

THE INNOVATIONS STRATEGY DEVELOPMENT PROCESS BASED ON INNOVATION ARCHITECTURE: The Importance of an Innovation Strategy - Developing an Innovation Strategy: Phase I: Identification - Phase II: Evaluation of innovation opportunities - Phase III: Formulating the innovation strategy - Summary and Outlook

TECHNOLOGY AND INNOVATION MANAGEMENT IN SME/NTBF: TECHNOLOGY MANAGEMENT FOR START-UPS: PockeTTM: Definition of the NTBF - Does an NTBF need Technology Management - a PockeTTM? - Five Key Elements of PockeTTM: Doing technology intelligence - Development of technology strategy - Controlling technology management - Knowledge management - Network management - Integration of PockeTTM in the Firm Context