RESEARCH AND DEVELOPMENT MANAGEMENT

Fraunhofer German-Turkish Days Kick-off Conference, Istanbul

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Overview

- Trends and requirements towards industrial R&D
- Effectiveness and efficiency in R&D
- Success factors for R&D
R&D Management at Fraunhofer IAO
Our Unique Selling Point

R&D Management from Fraunhofer

- R&D Management by Europe's largest applied research and development organization
- We are "Non Profit" – our mission is the "direct benefit for the economy"!
- The combination of current research results with proven industrial practices
- Several thousand technology experts as Fraunhofer colleagues are supporting us.
- More than 20 years of competence in industrial R&D-Management
- Many years of international experiences and references (Europe, US, Brazil, Korea, China, Turkey, Australia, ...)
- Worldwide network of partner organisations
Current challenges for R&D

- Rising **globalisation**
- Increasing **complexity** vs. tightened **price pressure**
- Growing development efforts vs. **shortening development time**
- More **complex customer demands** and **quality** requirements
- Application of new technologies and materials
- Flexibility and increase in ability to **respond on market demands**
- Labour **Cost** in Western Europe: higher Costs – better & smarter
- **Lack of Skilled People**
- **End of the Boom** in BRIC, BRIKT? Where are the growing future markets?
- **Aging Society** – New Work Content and Work Place Design but also New Market Segment
- **New Business Models**: Value decoupled from (selling) Hardware?
- …
Industrial R&D – IAO trend study 2013
Trends and Key Challenges*

#1 Customer orientation and involvement
(customizing/co-design/co-development)

#2 R&D staff
(competence development/talent attraction strategies/career systems)

#3 Strategic effectiveness
(strategic orientation/trend scouting/use of knowledge sources)

#4 Process efficiency
(consistent processes/lean development)

*Findings based on survey performed in 2013 among 162 German R&D experts from advanced manufacturing, automotive and medical technology sector
Industrial R&D – IAO trend study 2013
Objectives and Strategies in R&D

- The main R&D objectives: above average fulfilment of customer expectations

- Main business strategies:
  Unique product features (47%)
  concentrating on market niches (43%)

- Technology strategy:
  high proportion of pioneers in all branches

Source article: http://www.spiegel.de/auto/aktuell/local-motors-buggy-gewinnt-design-wettbewerb-fuer-autos-aus-3d-drucker-a-976837.html
Picture: http://www.t-systems.de/umn/uti/753754_2/blobBinary/LocalMotors.pdf?ts_layoutId=753730
Research & Development: Steering of productivity, performance and success

Main objectives of R&D Management: Effectiveness and efficiency

Effectiveness

“Doing the right things”

Which R&D activities have to be carried out?

features/quality of outputs

Efficiency

“Doing the things right”

How are the selected R&D activities conducted?

Relation Input-Output / efficient use of resources

Quelle: nach Specht u.a. 2002
Main success factors for R&D

- Strategy
- Program Management
- Efficient Processes
- Motivated R&D Staff
Strategic R&D Management at FESTO

Technology-/Market-/Environment Observation, Scenario development

Szenario A: Arctic
- Einmütige Struktur der Maste
- Übereinstimmende Kundenanforderungen
- Global orientierte Unternehmen
- Stark homogene Produktkonzepte

Szenario B: Sierra Nevada
- Auffällige Kundenstruktur
- Besondere Kundenanforderungen
- Mühe im Netzwerk
- Viel Vielfalt der Produktkonzepte

Szenario C: Amazonas
- Heterogene Kundenstruktur
- Spezifische, individuelle Kundenanforderungen
- Zeitliche, kleine Nischenanbieter
- Vielfältiges mit spezifische Produktkonzepte

Strategic planning, Product/Market/Technology Portfolios & Roadmaps

Development of technologies, products and services

Strategy
Setting up a R&D strategy

The R&D strategy describes

- **Objectives** of R&D
- **Scope of the R&D program** in terms of content, time and efforts (i.e. projects and activities)
- **R&D focus and priorities**
- **Internal development competences** and **strategic cooperation's**, respectively development deepness (**Make-or-Buy**) and intensity (basics or applied)
- **Framework conditions and basics for the execution** of the R&D program (efficiency) -> “Lean Development”
- **Integration into business strategy**

The R&D strategy is derived from

- Cooperate strategy / business unit strategy
- Current technology and competences
- Future trends and requirements of the market, technology and competition

Picture: www.gearlive.com/gallery/image/1904
Program Management in R&D

R&D Project program planning

- uses R&D portfolio management
- assumes that a consistent and actual R&D strategy exists
- controls R&D productivity by significant influence on effectiveness and efficiency
- connects strategic and operative R&D plans
- needs a classification of the project types (research-, technology-, pre-development-, product/process development-, platform development)
- uses qualitative and quantitative evaluation methods (portfolio, Net Present Value (NPV), …)
- allows the “optimization” of the R&D project mix and the use of resources

Integrated roadmapping at ThyssenKrupp

Markets

Products

Product Development Projects

Technologies

Technology Development Programs

Knowledge & Competencies

source: Hans-Georg Schnauffer. ThyssenKrupp AG. Corporate Center Corporate Programs
Fast, lean and efficient development processes

30 years Stage-Gate® vs. agile, iterative development

Stage-Gate® - concept:
strongly sequentially

Agile development and SCRUM:
incremental, iterative and adaptive

Agile product development and SCRUM
- As an addition or alternative to the Stage-Gate® concept
- Faster and self coordinated
- Reduces the development risks

Fast, lean and efficient development processes

Important measures

- **3-Phase concept with pre-development**

- **Toyotas Lean concepts:**
  - Customer oriented “value adding” and “waste”
  - Development as a leveled flow („create a leveled flow“) with
  - Pull principal
  - Process-CIP

- **Scaled processes**

- **Process Re-Engineering:**
  - **Technology first** (instead of administration)
  - **Process interfaces** and (internal) customer–supplier relationship

Source: IAO Lean Development

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**Efficient Processes**

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Staff in R&D

- Motivated employees are a/the crucial success factor in R&D
- Trend to flat hierarchies, projects and innovation
- Internationalization and social change as external factors
- Continuously need for development and introduction of new career and incentive systems

Social factors:

- interlinking of working and family life
- Increased „career breaks”
- Constantly adjustment of employee qualifications

Bild-Quelle: www.zukunftsinstitut.de/verlag/studien_detail.php?nr=58

Motivated R&D Staff
talk to us

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Thank You!

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