# Intellectual Capital Reporting: Implementation and experiences at the Austrian Research Centers

**KM-Academy-Session on "ICR (*Wissensbilanzierung*) at ARC"**
**Vienna, 13th February 2003**

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**former CEO of the Austrian Research Centers**
**(This presentation is mostly based on reports and presentations originally developed at**
**ARC Seibersdorf research GmbH**
**by**
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# Motivations for Intellectual Capital (IC) Reporting

- **Increased investments in intangible assets such as R&D, innovation, training, software, customer relationships, brands, etc.**

- **Traditional accounts + financial indicators lose relevance for the decision-making of managers and investors, no capitalisation of of intangible assets**

- **IC Reporting originallly was developed for private firms with the aim to deliver information to stakeholders on the value of intangible resources, not covered by the traditional financial reporting systems**

- **The lack of reporting about intangible assets creates information asymmetries and thus increases volatility and the price of capital**

- **In every European country at least a handful of advanced firms started to implement IC reporting**

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# International und national initiatives

- **OECD: Concept of „Knowledge-based Economy"**

- **EC: Funding of Research Programs and Conferences**

- **National initiatives in NL, UK, DK and NO (Industrial Sector)**

- **Development of Guidelines for IC Reporting: MERITUM, Denmark**

- **Activities of Accounting boards: IAS, FASB, DRS**

- **EARTO, EARMA and ESMU: Discussion about Intellectual Capital Reporting for Universities and Research Organisations**

# Methods used so far for valuing intangible assets / intellectual capital

1. **Financial valuation**

   - **cost, income, market approach …**

2. **Indicator-based systems**

   - **classifications of intellectual capital**

   - **process models**

3. **Qualitative valuation**

   - **Storytelling, visualisations ...**

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# IC Report: Definition and Characteristics

- **General definition:**

  *„An IC Report is a new kind of reporting system, which monitors, measures and values knowledge-based processes and intangible investments as well as the results of these processes and investments."*

- **Comparison of „costs" and „benefits"  (criteria need to be defined)**

- **Classification of intangible assets / intellectual capital**

- **Use of non-financial and financial indicators**

- **Valuation of information and indicators is context- and aim-specific**

- **Potential application for all knowledge-intensive organisations**

# Research & Technology Organisations (and also ARC) across Europe are confronted with new challenges ...

1. **Transformation of the science and innovation system**

2. **New funding mechanisms, more autonomy and new forms of competition**
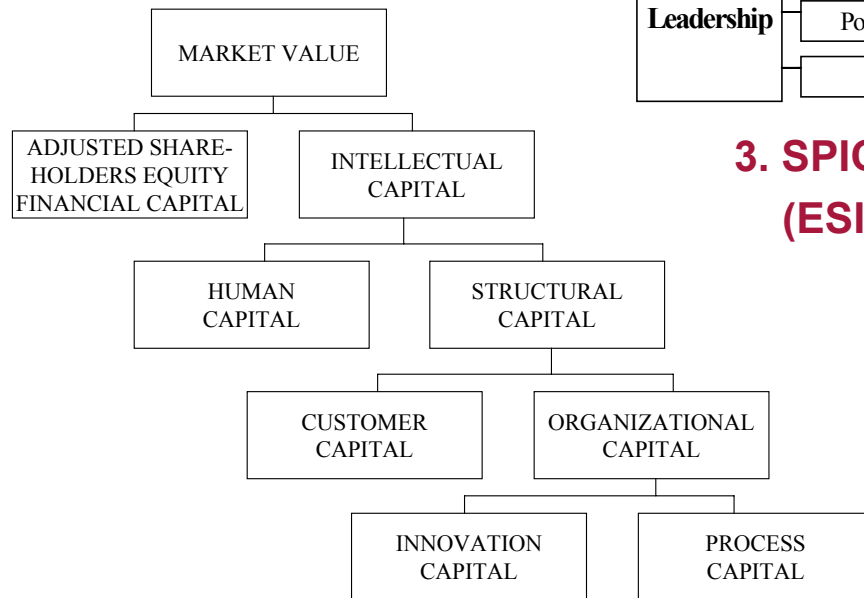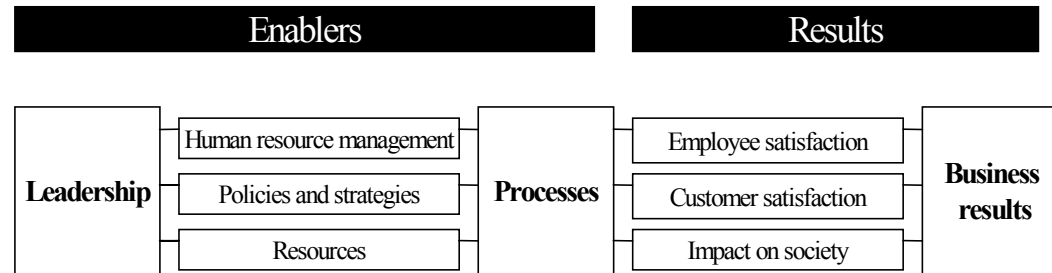
3. **Call for accountability and transparency**

⇨ **There is a demand for new management and reporting instruments which deliver information for internal decision makers and external stakeholders**

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# Specifics of Contract Research Organisations (CROs)

- **CROs have different stakeholders, investors, financiers and provide for different markets**

- **CROs transfer academic & scientific knowledge into practical application**

- **CROs assume the risk of research in the early stage of the innovation process**

- **Different types of output (e.g. ARCS):**
  - ⇨ **Development of prototypes and software**
  - ⇨ **Provision of standards, manuals, environmental measures**
  - ⇨ **Publications and lectures**
  - ⇨ **Development and application of measuring and testing techniques and services**
  - ⇨ **Expert opinions on current research topics**
  - ⇨ **Education and training of young researchers**
  - ⇨ **Management of networks (e.g. EU-R&D-Programs, Clusters)**

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# Story „behind" the Austrian ICR project

## 1. EFQM-Model (end 80ies) : „Quality-> Results"

| Enablers | | Results | |
|---|---|---|---|
| **Leadership** | Human resource management | Employee satisfaction | **Business results** |
| | Policies and strategies | Customer satisfaction | |
| | Resources | Impact on society | |

(with **Processes** between Enablers and Results)

## 3. SPICE „Process Improvement"

## (ESI Bilbao / Koch; end 90ies -> Seibersdorf)

Bereich Informationstechnik & Telematik

**ISO 15504: Process macromodel**

MARKET VALUE
- ADJUSTED SHARE-HOLDERS EQUITY FINANCIAL CAPITAL
- INTELLECTUAL CAPITAL
  - HUMAN CAPITAL
  - STRUCTURAL CAPITAL
    - CUSTOMER CAPITAL
    - ORGANIZATIONAL CAPITAL
      - INNOVATION CAPITAL
      - PROCESS CAPITAL

Customer-Supplier
Engineering
Management
Organization
Support

## 2. IC-Skandia-Model (mid 90ies): „I-Capital" -> M-Value

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AUSTRIAN RESEARCH CENTERS

# Today's insights on „i-assets" = they are defined & classifiable !

| Assets | | | | |
|---|---|---|---|---|
| Traditional Accounting Assets | | Intellectual Capital Assets | | |
| **M o n e t a r y** | **Physical** | **R e l a t i o n a l** | **S t r u c t u r a l /** | **H u m a n** |
| ■ Cash<br>■ Investments<br>■ Receivables/Debtors<br>■ Payables/Creditors | ■ Property<br>■ Plant<br>■ Equipment<br>■ Inventory –<br>➢ Finished Goods<br>➢ WIP<br>➢ Parts/Raw Materials | ■ **Customer Contracts**<br>■ **Formal Alliances (JVs, Supply Agreements)** | ■ **Systems**<br>■ **Formalized Processes**<br>■ **Codified Knowledge**<br>■ **Patents**<br>■ **Brands**<br>■ **Mastheads** | ■ **Acknowledged Skill Sets**<br>■ **Experience**<br>■ **Employee Loyalty** |
| ■ Credit Rating/s<br>■ Undrawn Facilities<br>■ Borrowing Capacity (relative to like companies – based on character)<br>■ Borrowing Covenant Slack<br>■ Receivables and Accruals Certainty<br>■ Quality of Earnings<br>■ Balance Sheet Strength | ■ Plant Flexibility<br>■ Plant Modernity<br>■ Infrastructure Surrounding Plant/s<br>■ Stranded Assets?<br>■ Tradability" of Facilities?<br>■ Access Rights<br>■ Plant Regard ("Can Do"; "Will Do")<br>■ Inventory Good, Obsolete, Redundant) | ■ **Customer Loyalty**<br>➢ **Behavioral**<br>➢ **Attitudinal**<br>■ **Quality of Supply Contracts**<br>■ **Right to Tender";Right to Compete"; "Right to Design"**<br>■ **Strength of Stakeholder Support (including Opinion Leaders)**<br>■ **Networks**<br>■ **Regulatory Imposts** | ■ **Structural Appropriateness**<br>■ **Informal Processes**<br>■ **Organizational Reputation**<br>■ **Brand Meaning (Strength; Stature)**<br>■ **Productivity of R&D Process**<br>■ **Quality of Corporate Governance**<br>■ **Know How"**<br>■ **Tacit Knowledge** | ■ **Top Management Quality**<br>■ **Top Management Experience**<br>■ **Ability to Execute on Strategy**<br>■ **Capabilities**<br>■ **Problem Solving Ability**<br>■ **Employee Loyalty –**<br>➢ **Behavioral**<br>➢ **Attitudinal**<br>■ **Personnel Reputation** |

Left side row labels: **Tangible Assets** (top), **Intangible Assets** (bottom)

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# The ARC IC Reporting Model
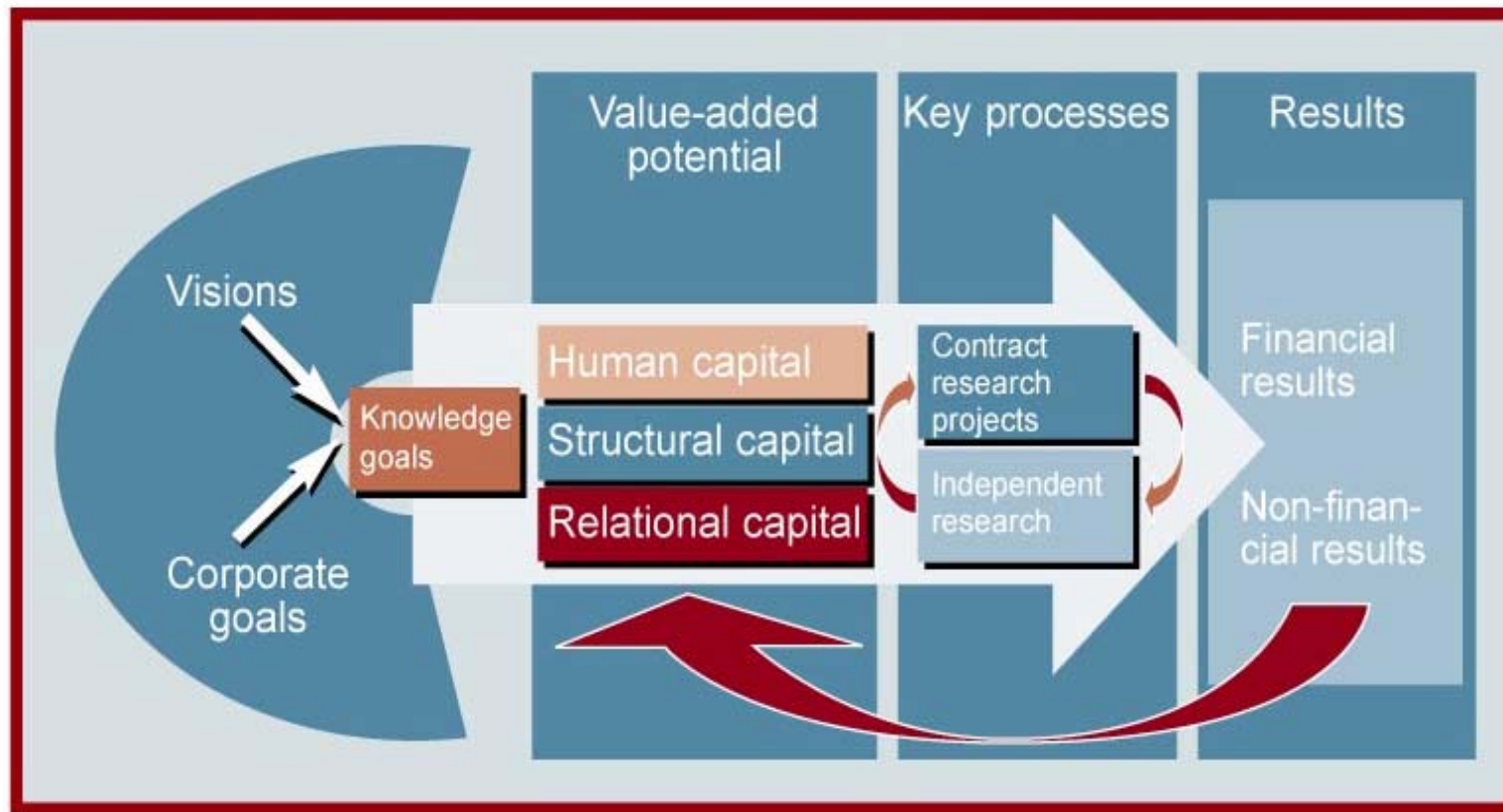


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# Knowledge & K-H Goals

*Knowledge Goal 1:*  **Knowledge Transfer**
We intend to transfer application-oriented knowledge from science to business and government authorities, and to develop the competencies and structures required for this purpose.

*Knowledge Goal 2:*  **Interdisciplinarity**
We intend to increase the degree of interdisciplinarity on our work and thus our universal problem-solving ability by means of close communication and copooeration between internal and external players.

*Knowledge Goal 3:*  **Research Management  Professionalisation**
We intend to establish competencies and processes to optimize the professional management of our research projects..

*Knowledge Goal 4:*  **Internationality**
We intend to open up the global research market, creating suitable networks, structures and processes for this purpose so as to achieve international success.

*Knowledge Goal 5:*  **Spin-offs & Investments**
We intend to take full commercial advantage of our research results and products by working with private investors and strategic partners, and by creating ideal in-house conditions to achieve this goal.

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# Human Capital
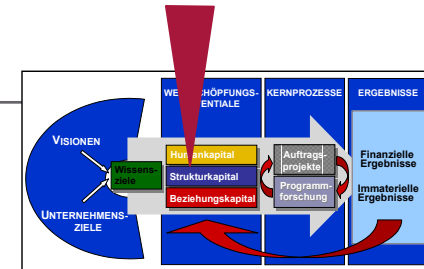
| | 1999 | 2000 | 2001 | Bench mark DLR |
|---|---|---|---|---|
| *Human Resources* | | | | |
| *Total Staff influx* | *62* | *92* | *47* | |
| *Research Staff* | *31* | *61* | *26* | |
| *Total staff fluctuation (%)* | *11,7* | *14,9* | *10,9* | *19* |
| *Total staff resignations* | *56* | *72* | *42* | *914* |
| *Total research staff* | *30* | *44* | *19* | |
| *Of whom aged 25-35 (%)* | *40* | *55* | *26* | |
| *Within 2 years (%)* | *17* | *36* | *80* | |
| *Of whom retired (%)* | *23* | *2* | *5* | |
| *Total retirements* | *17* | *2* | *2* | |
| *Average time of employment (in years)* | *12* | *11,7* | *11,3* | *11,0* |
| *Proportion of research staff (%)* | *43,0* | *45,3* | *56,0* | |
| *Expenditure for staff development (€ 1,000)* | 180 | 228 | 382 | |
| *Training* | | | | |
| *Total days training per employee* | *3,55* | *5,62* | *5,19* | *1,7(int.)* |
| *Communication & management* | *1,40* | *1,68* | *2,12* | |
| *Computer literacy* | *0,45* | *0,92* | *0,78* | |
| *Specialised* | *1,70* | *3,02* | *2,29* | |
| *Training expenditure / turnover (%)* | *1,7* | *2,3* | *2,3* | |

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# „I-Capital"

# Structural Capital
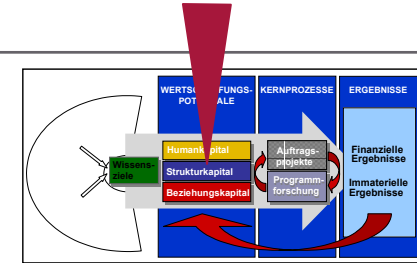


| | 1999 | 2000 | 2001 | Bench mark DLR |
|---|---:|---:|---:|---:|
| ***Processes and equipment*** | | | | |
| IT-Expenses per employee (€) | 2,233 | 2,852 | 2,569 | 9,800 |
| Teleworking jobs | 0 | 0 | 0 | 61 |
| Processes: project schedule adherence (%) | 55 | 81,5 | 78,5 | |
| Hit rate for EU research programs (%) | 30 | 40 | 27 | 40 |
| Database searches | 385 | 591 | 533 | |

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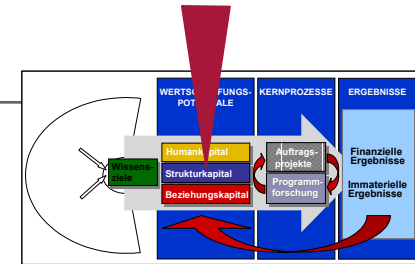
„I-Capital"

# Relational Capital

| | 1999 | 2000 | 2001 | Bench mark DLR |
|---|---|---|---|---|
| *Project cooperation and networking* | | | | |
| EU-projects (in % of all new projects) | 9 | 9,3 | 2,3 | |
| Interdepartmental projects (in % of all new projects) | 9,2 | 10,3 | 14,5 | |
| Research activities abroad in man-month | 0 | 0 | 12 | 423 |
| Number of international researchers (% of total staff) | 6,2 | 5,7 | 5,6 | 6,2 |
| Institute heads with teaching assignments (%) | 50 | 50 | 50 | 100 |
| *Diffusion and networking (per researcher)* | | | | |
| Total number of conferences attended | 1,14 | 1,53 | 1,40 | |
| Papers at scientific conferences | 0,88 | 1,00 | 1,79 | |
| Board representation: scientific, industrial, political | 0,65 | 0,83 | 0,60 | |
| Teaching assignments | 0,19 | 0,17 | 0,19 | |

# „Key Processes"

# Independent Research
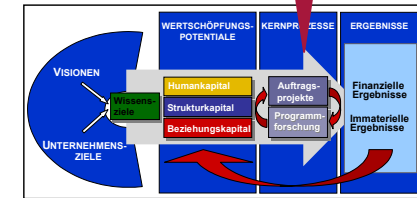
| | 1999 | 2000 | 2001 |
|---|---|---|---|
| Number of program categories | 9 | 10 | 7 |
| Proportion of independent research in total expenditures (%) | 43 | 46 | 54,7 |
| Proportion of international programs | 19 | 10 | 4 |
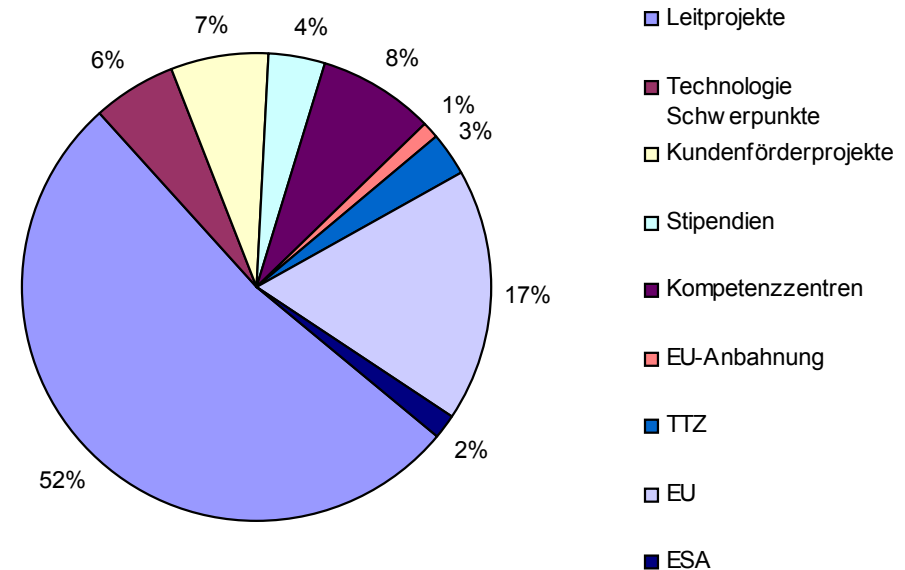


**Program categories (in % of total expenditures)**

Legend:
- Leitprojekte
- Technologie Schwerpunkte
- Kundenförderprojekte
- Stipendien
- Kompetenzzentren
- EU-Anbahnung
- TTZ
- EU
- ESA

Pie values: 52%, 6%, 7%, 4%, 8%, 1%, 3%, 17%, 2%

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# Beispiel: Entwicklung von „Wissensprodukten " in den Austrian Research Centers



Wissens-element/engineering know how

**Neue industrielle F&E-Kooperation**

KU

KF (EU)

KF

LP

KU

**Patent für neue Technologie**

KF (EU)

Wissens-element/scientific knowledge

LP

**Zertifikat für Managementsysteme**

KU

KU

KF

KU

**Neuer Kundenauftrag**

LP

Wissens-element/Verfahrens-entwicklung

*LP = Leitprojekte der unabh. Forschung*
*KF = Forschungskooperationen mit Ind.*
*KU = Auftragsforschung*

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Serving science with advanced management knowledge

# Financial Results



| | 1999 | 2000 | 2001 | Bench mark DLR |
|---|---|---|---|---|
| ***Financial results*** | | | | |
| Total operating revenues (€ m.) | 58,9 | 67,6 | 52,8 | |
| Growth compared to previous year (%) | 17 | 15 | | |
| Financing from own resources (%) | 65 | 66 | 63 | 46 |
| ***Economy-oriented results*** | | | | |
| Number of newly acquired contract projects | 194 | 204 | 221 | |
| Number of new projects from companies (%) | 53 | 61 | 55 | |
| Of which SME (%) | | | 46 | |
| Of which domestic (in %) | 66 | 83 | 66 | |
| Of which foreign (in %) | 34 | 17 | 34 | |
| Number of new customers (%) | 20,3 | 40,7 | 195 | |
| Coordination of EU projects and networks | 8 | 8 | 5 | |
| Number of spin-offs | 2 | 1 | 1 | 8 |
| Accredited test procedures | 1,100 | 1,149 | 1,169 | |
| Revenues from licences (€ 1,000) | 56 | 57 | 45 | |
| Number for customer courses and seminars | 271 | 497 | 1,107 | |

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# Non-financial Results
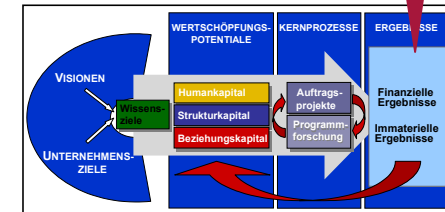


| | 1999 | 2000 | 2001 | Bench mark DLR |
|---|---|---|---|---|
| ***Research-oriented results*** | | | | |
| Per research worker | | | | |
| Publications: Scientific journals | 0,14 | 0,25 | 0,33 | 0,33 |
| Publications: Trade Journals, proceedings, books | 0,92 | 0,87 | 1,15 | |
| Papers at scientific conferences | 0,88 | 0,99 | 1,79 | |
| Teaching assignments | 0,19 | 0,17 | 0,19 | 0,08 |
| Patents issued | 4 | 2 | 2 | 198 |
| Theses and dissertations completed | 12 | 9 | 24 | |
| ***Society-oriented results*** | | | | |
| Participation in committees (per researcher) | 0,65 | 0,83 | 0,60 | |
| Political consulting projects | 4 | 10 | 15 | |
| „Response indicator" (explicit mention of ARC in the media) | 1,353 | 737 | 640 | |
| External Internet page visits per month (per employee) | | | 810 | 502 |

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## Consolidated Financial Results (1998-2003 (+2) Austrian Research Centers-Group)



In MEUR

| | IST 1998 [2] | IST 1999 [3] | IST 2000 [3] | IST 2001 | HS 2002 | Budget 2003 | MFP 2004 | MFP 2005 |
|---|---|---|---|---|---|---|---|---|
| Summe betriebl. Erträge | 72,74 | 79,14 | 92,47 [1] | 91,82 | 94,37 | 102,19 | 119,98 | 129,49 |
| Eigenfinanzierungsanteil in % | 51% | 56% | 62% | 63% | 64% | 66% | 66% | 66% |
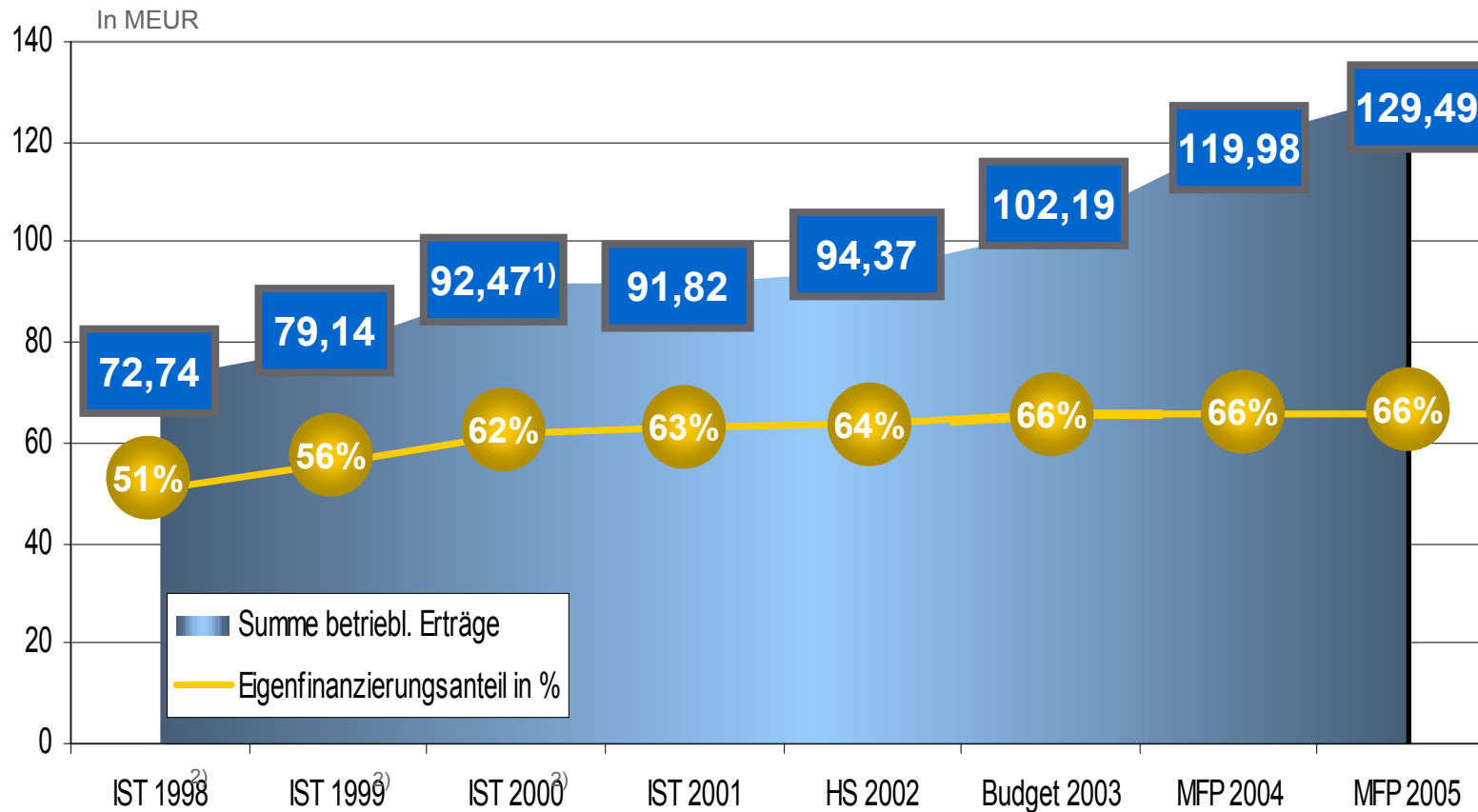
1) inkl. ca. 0,64 Mio Eur Leistungen innerhalb der ARC-Gruppe     2) Summe betrieblicher Erträge inkl. Investitionszuschüsse 1998: 1,60  1999: 2,05  2000: 1,09

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# IAS - Balance <-> IC Reporting: the „ISFR-Revolution"

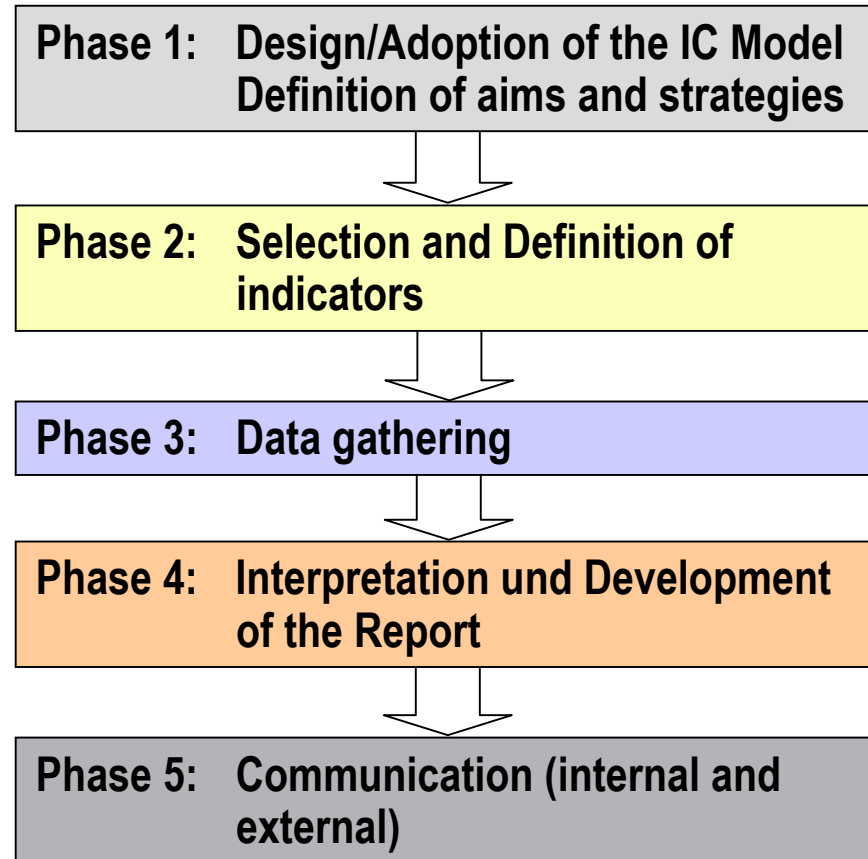| Accounting | |
|---|---|
| **Managerial accounting** | Financial accounting & reporting |
| **Decision facilitating** | Stewardship |
| „Relevance **and** Reliability" | |
| Management approach in International Accounting Standards | |
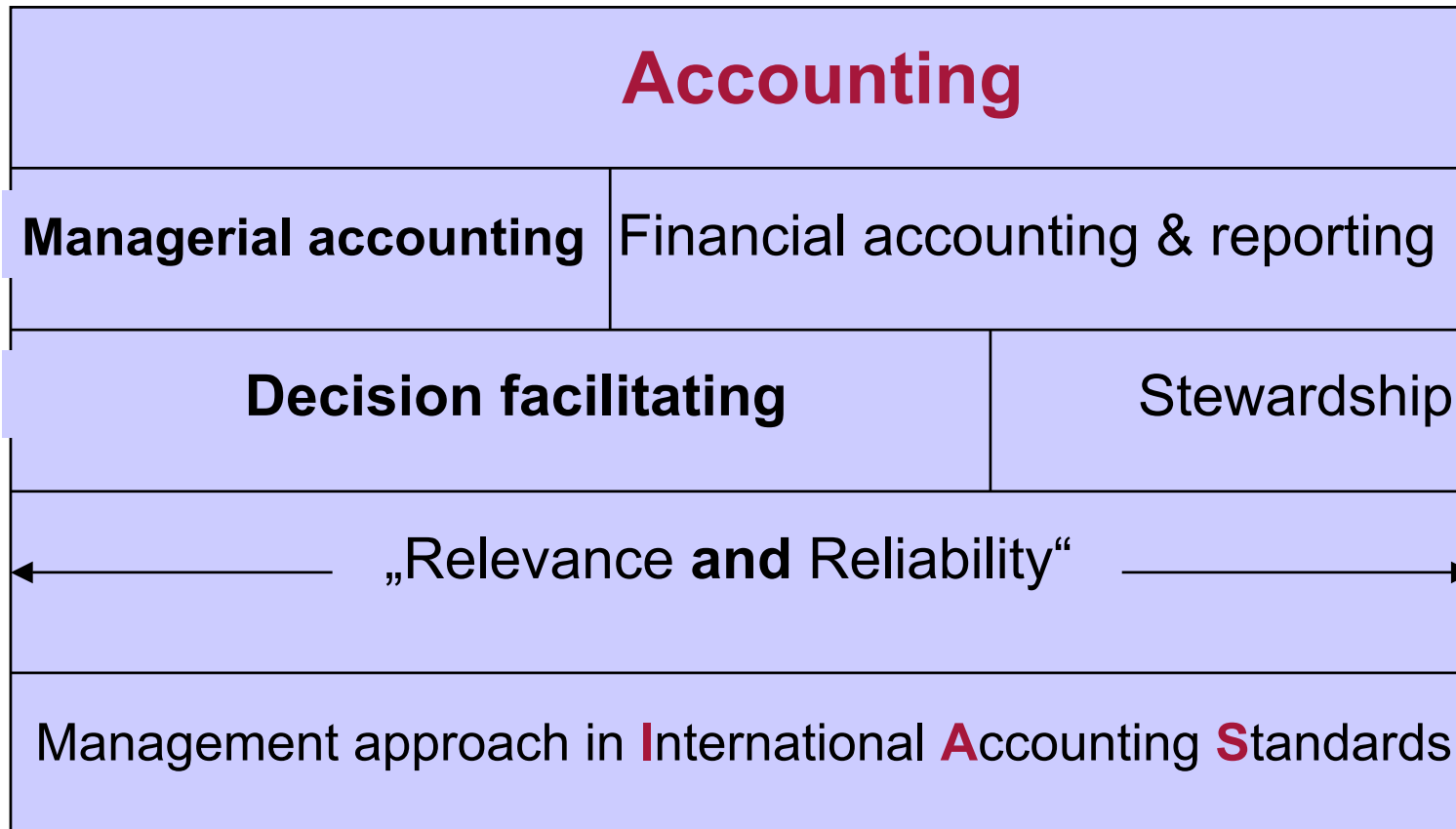
# IC Report: New challenges for interpretation

- **Financial and non-financial figures must be interpreted in common**

- **So far there are no standards, agreements, conventions and hardly reference frameworks or benchmarks for IC Reporting**

- **The specifics of investing in intangible assets and knowledge causes new rules for interpretation, e.g.**

  ⇨ **Knowledge can be both: resource and result**

  ⇨ **There is no clear boarder line between „black" and „red" figures**

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# The Implementation process

**Project phase**

**Success factors**

| | |
|---|---|
| **Phase 1:** | **Design/Adoption of the IC Model Definition of aims and strategies** |

↓

| | |
|---|---|
| **Phase 2:** | **Selection and Definition of indicators** |

↓

| | |
|---|---|
| **Phase 3:** | **Data gathering** |

↓

| | |
|---|---|
| **Phase 4:** | **Interpretation und Development of the Report** |

↓

| | |
|---|---|
| **Phase 5:** | **Communication (internal and external)** |

Coordination with other projects

Valuation is aim-specific

Valid Indicators? Resources?

Information on the project

Collective Learning

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# IC Report ARC 1999 -> 2000 -> 2001 -> 2002: Benefit and Impact

- **Positive feedback from all stakeholders**

- **Stimulation of the discussion on organisational strategies and aims, in specific Human Resource Development policy**

- **Broad communication of organisational values and aims**

- **Provision of information for the research management and for human resource development (on the department and project group level)**

- **Reading and interpreting the information provided provokes a learning process, looking at the ICR as…**

  ⇨ **… a management instrument**

  ⇨ **… a reporting & communication instrument**

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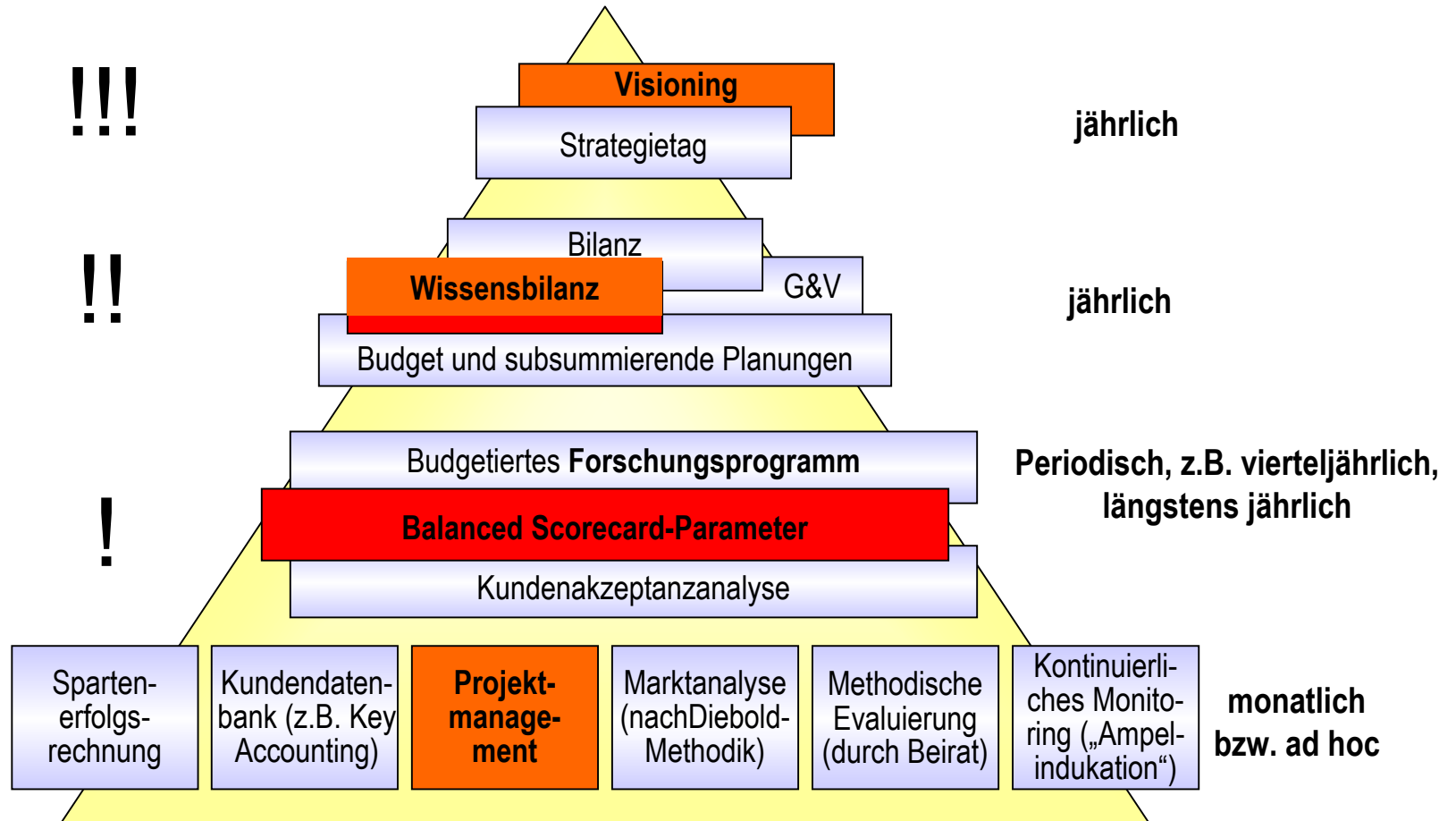
# Critical aspects

- **The interpretation is contingent on the context and aims of the organisation / unit**

- **The aggregation of indicators on the organisational level is difficult if the organisational units are heterogeneous**

- **We do not  yet have a standard model and commonly defined indicators so far, thus, at present, comparisons / benchmarks are of limited value**

- **If the context is taken into account, benchmarking stimulates mutual learning**

- **Trade-off between external reporting and internal management system**

- **Relations, or, more specific, „cause – effect channels" can not really (yet) be argued between inputs and outputs**
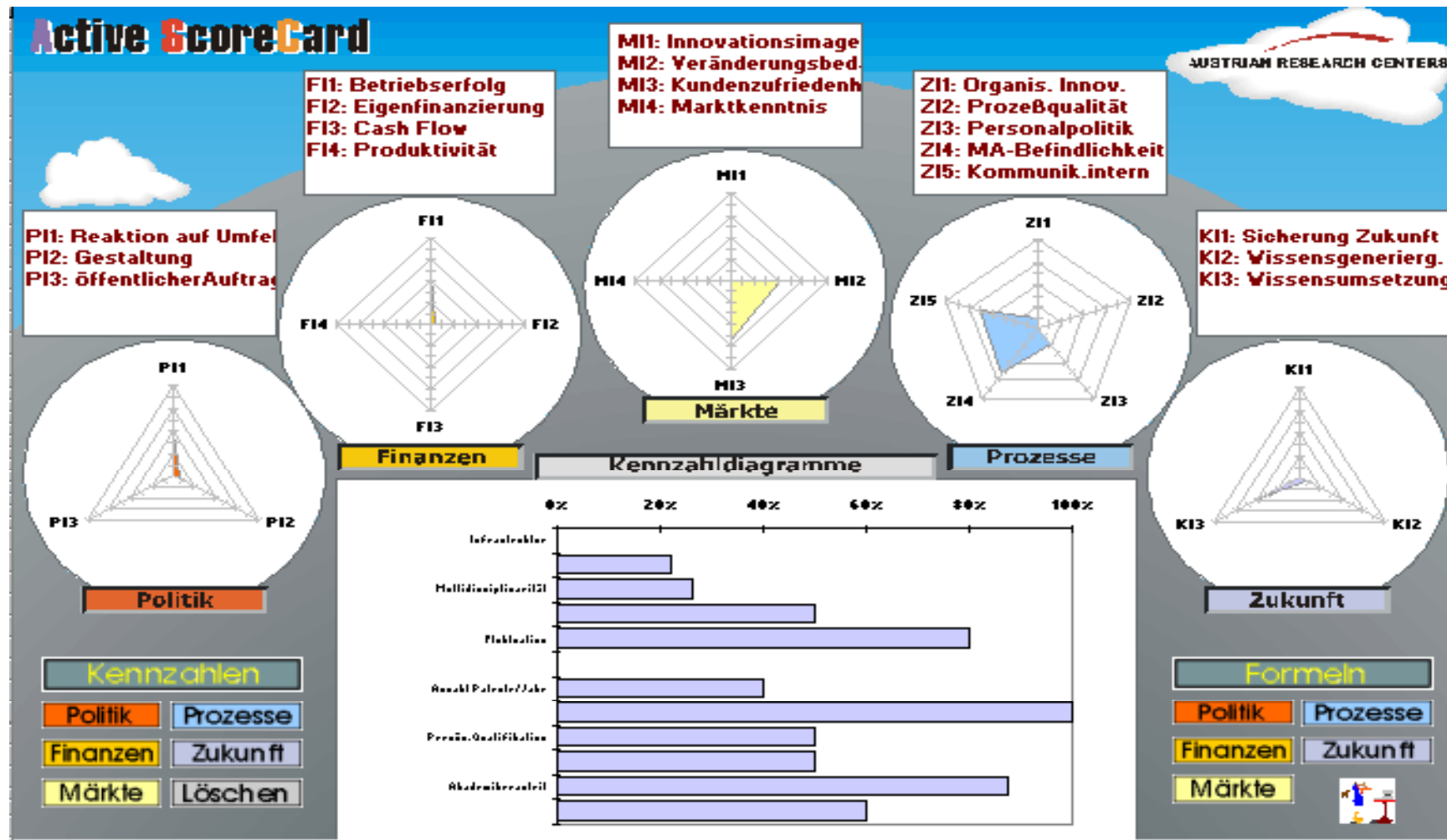
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# Challenges for the future

- **Fostering the awareness of the need of new management and reporting systems**

- **Establishment of guidelines for the development of IC reports for RTOs**

- **Definition of common indicators**

- **Establishment of a European-wide benchmark initiative**

- **Further methodological & theoretical development, ref. to monetary representations**

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# Wissensbilanzen nach dem ARC-Modell sind Teil eines zu integrierenden Management-Instrumentariums



!!!

**Visioning**

Strategietag

**jährlich**

!!

Bilanz

**Wissensbilanz**

G&V

**jährlich**

Budget und subsummierende Planungen

Budgetiertes **Forschungsprogramm**

**Balanced Scorecard-Parameter**

Kundenakzeptanzanalyse

**Periodisch, z.B. vierteljährlich, längstens jährlich**

!

| Sparten-erfolgs-rechnung | Kundendaten-bank (z.B. Key Accounting) | **Projekt-manage-ment** | Marktanalyse (nachDiebold-Methodik) | Methodische Evaluierung (durch Beirat) | Kontinuierli-ches Monito-ring („Ampel-indukation") |

**monatlich bzw. ad hoc**

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# Eine andere „Ausprägung": Die Active Score Card als Executive-Tool



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**Download-addresses:**

1. **ARC-Wissensbilanz:** www.arcs.ac.at/publik/fulltext/wissensbilanz
2. **European Workshop:** ftp://eurotech:icr@ftpstud.donau-uni.ac.at

**Other information material:**

**„Thementag Wissensbilanzen", Dez. 2003 (Programm):**

www.lemmens.de/konferenz/wissbil.pdf