Microsystems Technology Standardization

Demand – strategies – tasks

Results of the BMBF-funded project NOSTA, June - November 2009

Dr. Uwe Kleinkes, HANNOVER MESSE Forum „Innovations for Industry“, Tuesday, April 20, 11:30

Need for MEMS standardization

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- MEMS technologies are reaching commercialization status
- Standards heighten the acceptance and market opportunities of advanced technologies
- Standardization is one of the most important parameters for the competitiveness of an industry, along with patents
- Germany is a pioneer in many areas of MEMS development, but standardization lags behind, which endangers the industry's competitive advantage

Barriers for MEMS standardization

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- Complexity of MEMS technologies and diversity of processes make it difficult to reach a consensus
- Standardization bodies seem not to be attuned to the fast development of new technologies
- General interest in MEMS standardization in Germany is low > on the part of suppliers, users, and standardization bodies
- MEMS standardization efforts do not always lead to satisfying results, lack sustainability
- German SME claim that they have little impact on standardization on a national and international level

Opinions on MEMS standardization

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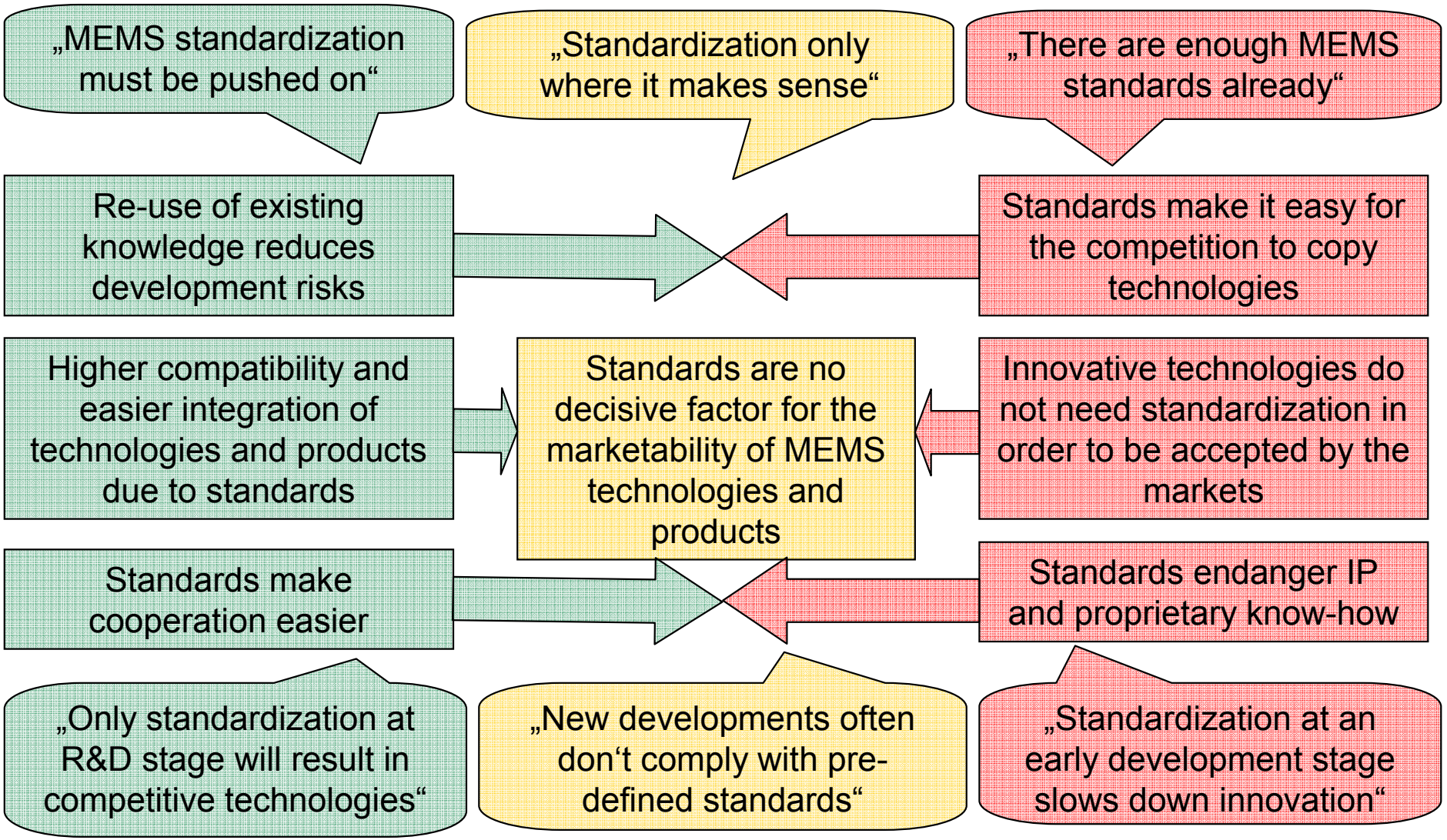

BMBF-project NOSTA (June – November 2009)

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- Objectives :
  - Identify the needs and opinions of the German MEMS industry regarding MEMS standardization
  - Recommend a course of action for MEMS developers, researchers, associations, standardization bodies and governments

BMBF-project NOSTA (June – November 2009)

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- Project steps:
  - Interviews with 5 experts from industry and research
  - Online survey of 900 companies and research institutes
  - Evaluation of survey results by experts from the MEMS industry
  - Definition of best practices in collaboration with industry representatives
  - Publication of a guideline for small and medium-sized companies

Industry survey

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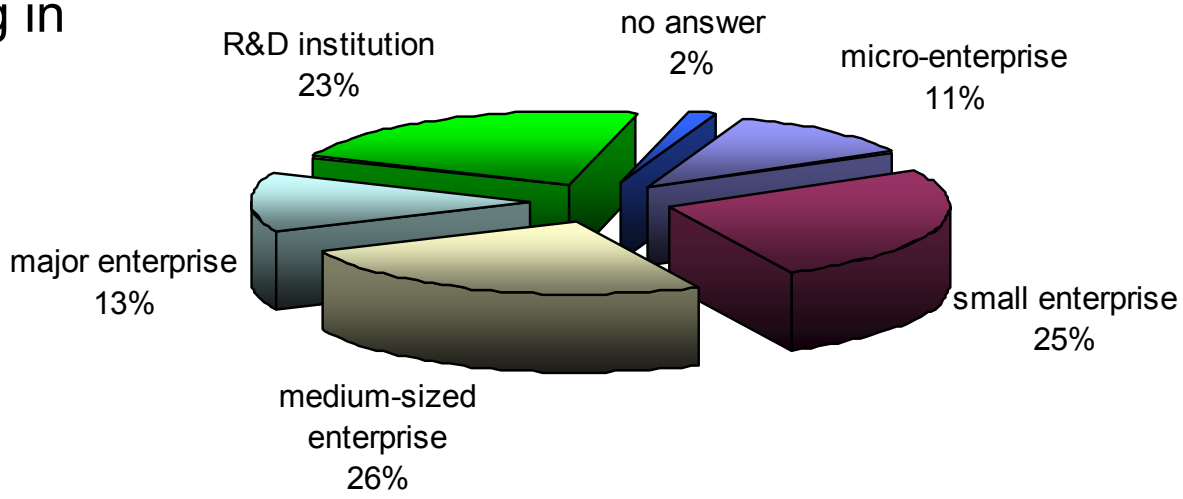
- Field period: July 20 – August 21, 2009

- Questionnaire sent to 900 persons
- Overall return 102 = 11.33 %
- Complete answers 62 = 6.88 %

- Return rates are satisfying in view of the specific topic

- Statistic analysis of 62 complete data sets



Areas where standardization is needed

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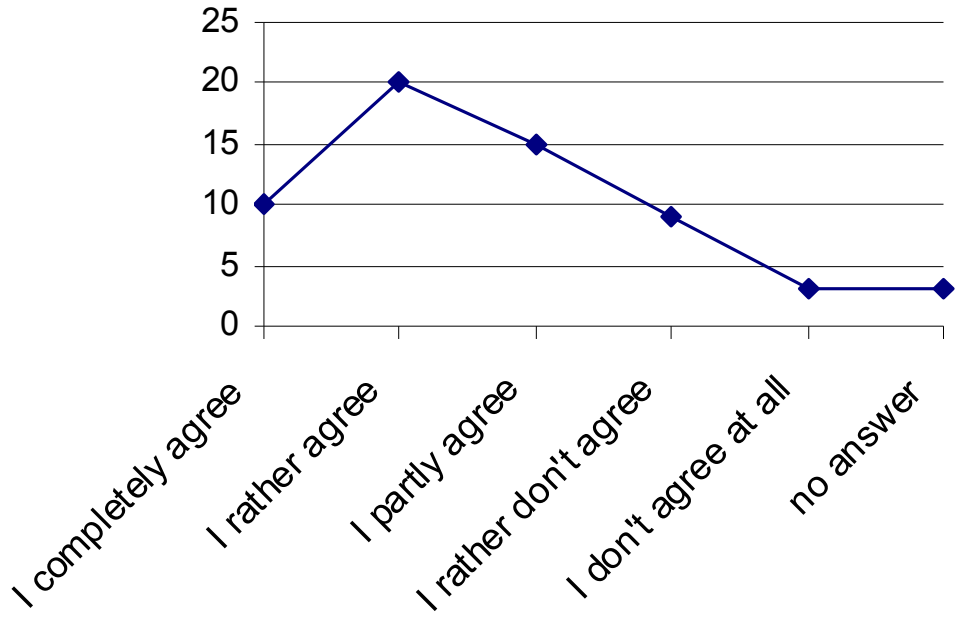
Being a cross-sectional technology with a wide range of possible applications microsystems technology cannot be standardized completely



Areas where standardization is needed

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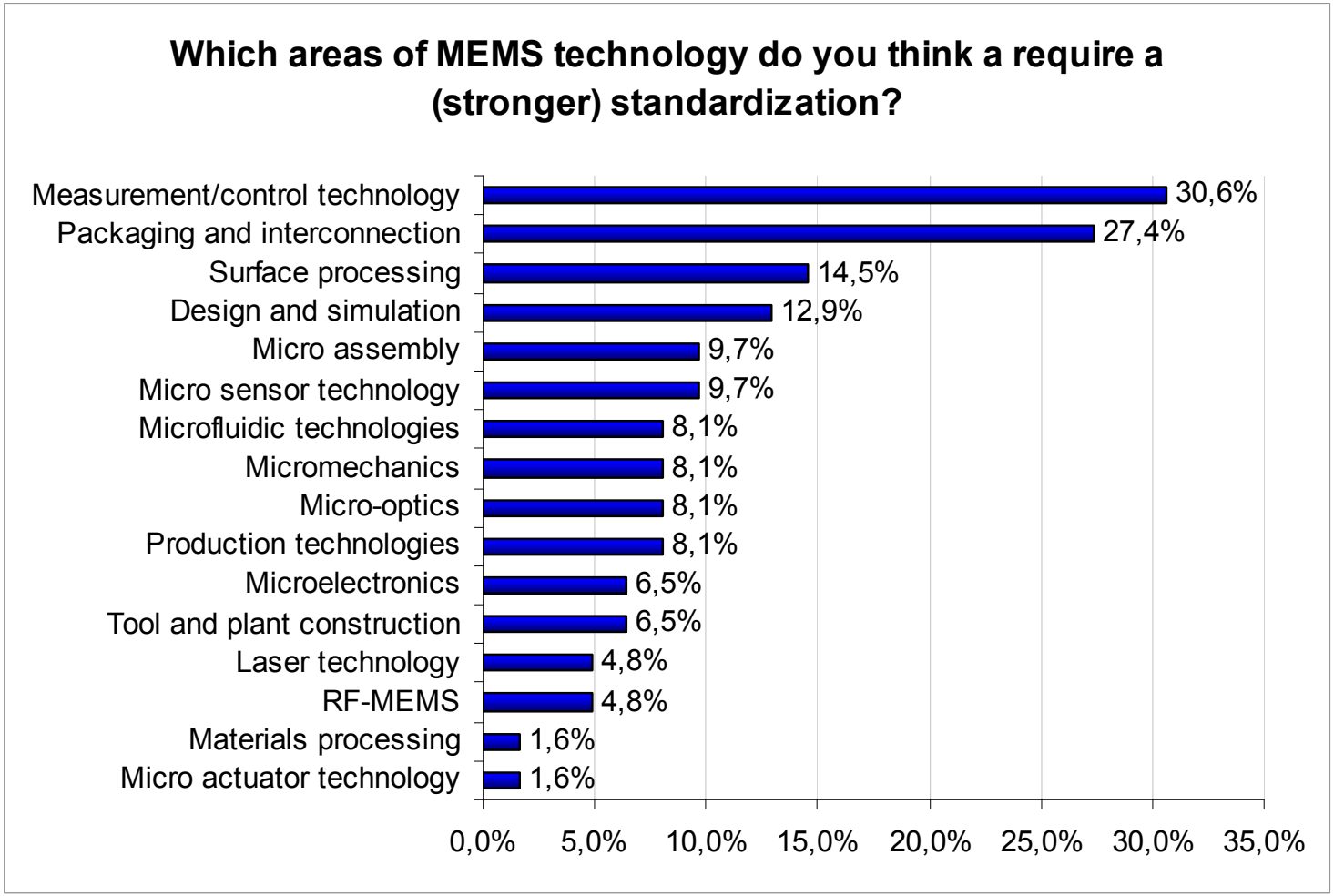

Challenge # 1: Diversity of technologies

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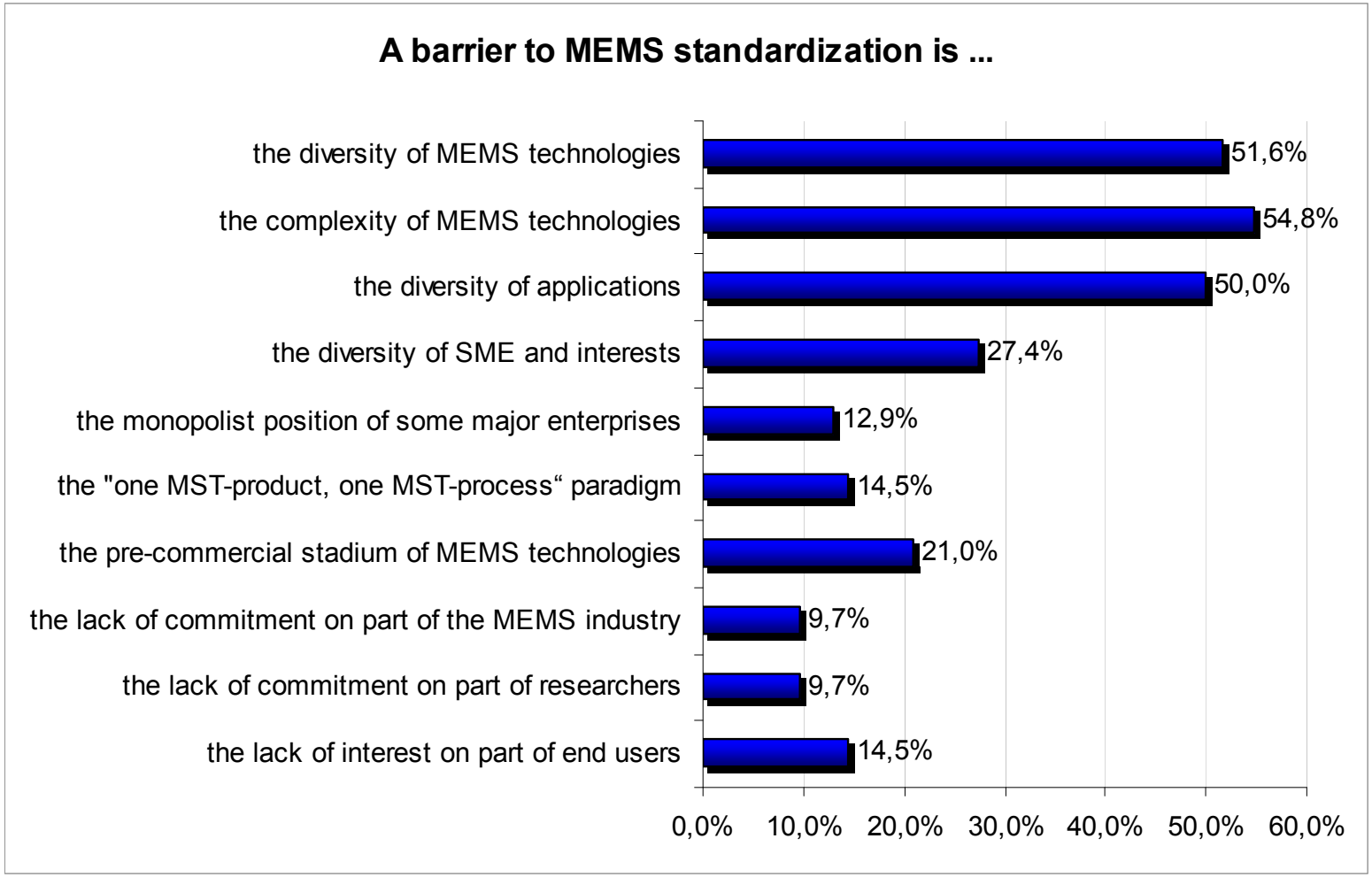

Challenge # 1: Diversity of technologies

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- Problems:
  - Diversity of technologies and processes as a special feature of microsystems technology: “one product, one process”
  - Different approaches to the same problem complicate communications and consensus findings
  - Fast succession of new technologies and processes makes standardization difficult

Challenge # 1: Diversity of technologies

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- Solutions:
  - Install technology-specific task forces, maybe coordinated by IVAM
  - Task forces define areas, where standards are needed and develop a roadmap for MEMS standardization
  - Regular updates of this roadmap in order to accommodate newly generated technologies
  - Standardization bodies and users are involved into the task forces

Challenge # 2: Lack of motivation

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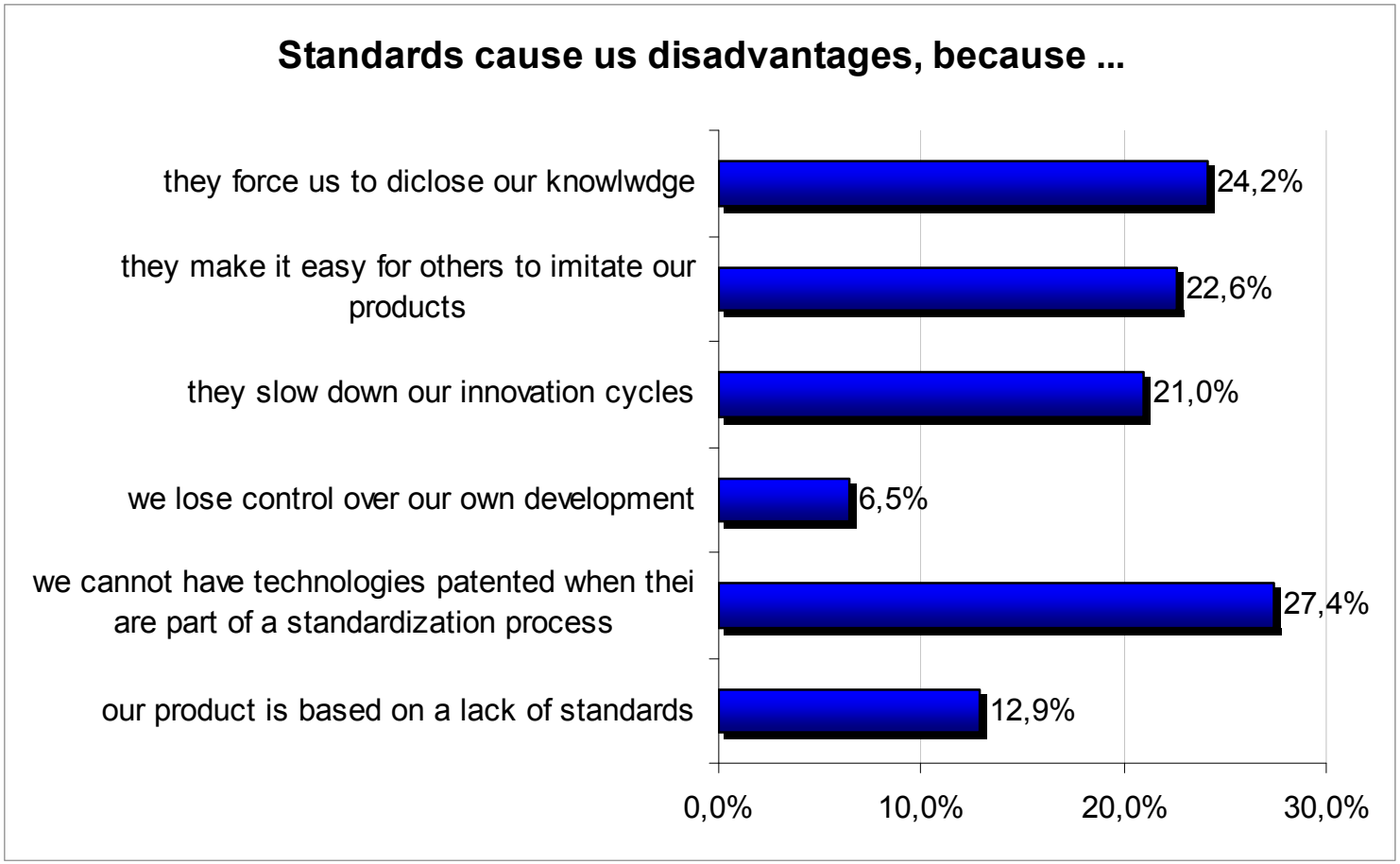

Challenge # 2: Lack of motivation

IVAM

- Problems:
  - MEMS standardization has a bad image in Germany, is seen to slow down technology development
  - Suppliers do not recognize the advantages of standards
  - Users have little interest in MEMS standardization
  - Standardization bodies do not establish enough work groups to cover all areas of MEMS technology where standardization is needed

Challenge # 2: Lack of motivation

IVAM

- Solutions:
  - Promote the advantages of standardization through an image campaign, steered by standardization bodies (DIN) and associations (VDE, IVAM)
  - Financial incentives for SME to get involved in standardization work (e.g. project funding, benefits for committee work)
  - Redistribute costs for committee work (e.g. share sales profits with committee members)
  - Offer guideline for users with case studies illustrating the advantages of standardization (e.g. calibration of measurement systems)
  - Offer more MEMS-related work groups at DIN and DKE

Challenge # 3: Ineffective procedures

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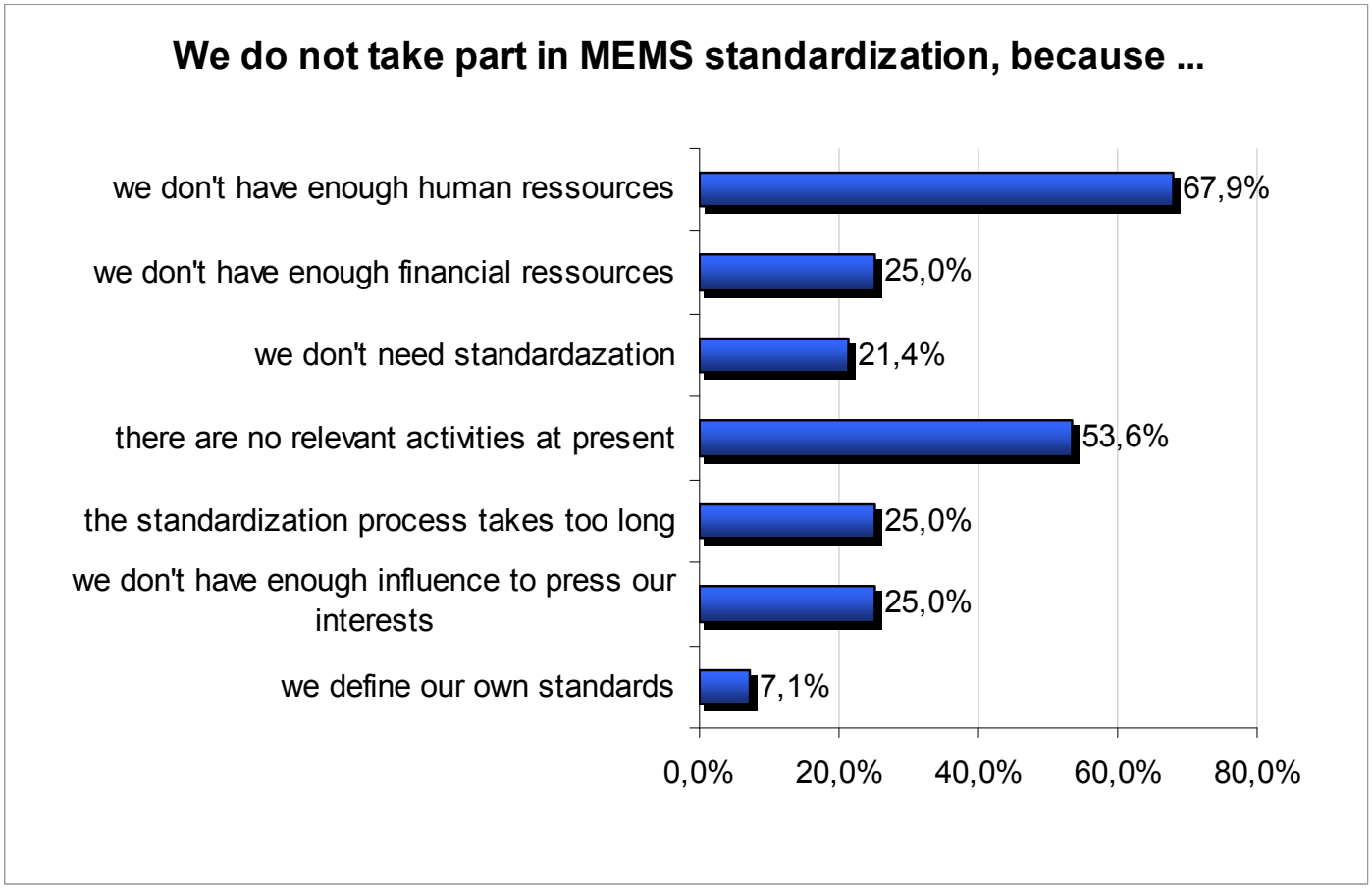

Challenge # 3: Ineffective procedures

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- Problems:
  - Standardization work is seen as boring, tedious, and ineffective
  - Committee work takes more time and money than SME can afford
  - MEMS standardization efforts are not efficiently coordinated, on a national as well as on an international level
  - MEMS standardization efforts lack sustainability

Challenge # 3: Ineffective procedures

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- Solutions:
  - Restructure and accelerate MEMS standardization processes > shorter periods for the determination of a standard should lead to faster (and more) results
  - Improve cooperation between national and international standardization bodies > e.g. through special MEMS standardization committee at DIN, that co-ordinates all relevant activities
  - Stronger link between government-funded projects and committee work to ensure that standardization projects continue after government funding has expired (“entwicklungsbegleitende Normung”)

Challenge # 4: Lack of information

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- Problems:
  - Companies do not get enough information about activities and options for taking part
  - Information concerning published standards or changes within the set of standard specifications are insufficiently communicated
  - The purchase of standards, specifications and guidelines is expensive and complicated, which constricts their use

Challenge # 4: Lack of information

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- Solutions:
  - Standardization bodies and associations need to inform about projects, results and about ways to participate
  - Publish information about MEMS standardization projects on a central platform
  - Insight to published standards and guidelines should be made possible without costs or travel

Who should act?

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IVAM	Federal Government	DIN, DKE
Co-ordinate task forces for standardization roadmap	Project funding for SME, if possible linked to committee work	More effective workshops, shorter deadlines
Install a MEMS standardization agent for image campaign and representation of interests	Individual benefits for SME that take up committee work (“signing-on bonus“)	Central standardization committee “MEMS“
Publish guideline on MEMS standardization for users	(Co-)funding of standardization-related projects and activities (NOSTA II)	More MEMS-related work groups
Host information platform on MEMS standardization (s. DIN, DKE)		Better information concerning work and results
		Redistribution of costs (sales revenues)
		central information platform for MST- standardization

Conclusion

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- Interest on behalf of the MEMS companies and R&D facilities in standardization issues and the need for discussions is high
- Experiences show, that the interest decreases, if there are no long-term appeals to participate, and when the standardization process is not made more attractive and more profitable for the participants
- A long-term and well organized strategy is more worthwhile than individual measures
- Strong co-ordination of activities on the part of MST-Companies, R&D facilities, associations, standardization bodies and governments is necessary

Guideline

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- Guideline for SME
- Basic information on standardization in Germany
- Case studies and field reports
- Results of an industry survey and expert interviews
- Best practice for companies, researchers, industry associations, standardization bodies, governments
- PDF file available at www.ivam-research.de