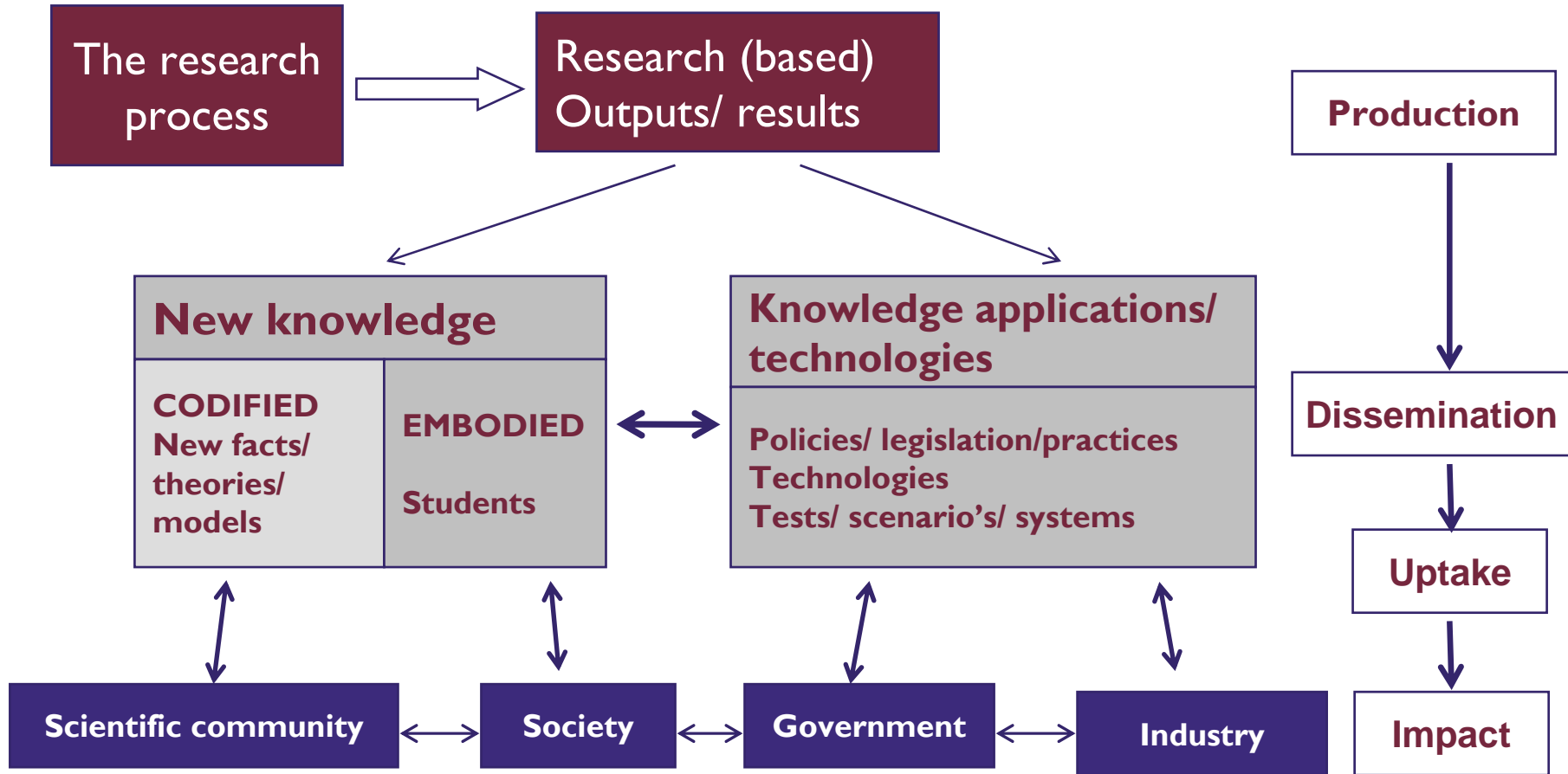


# Knowledge production, dissemination, uptake and impact





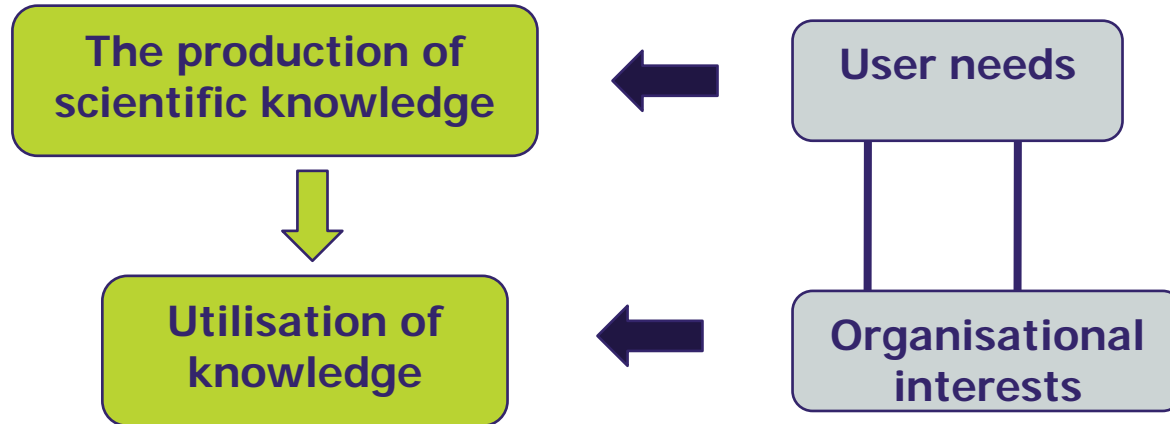
### Science push model of research utilisation



The **supply of advances in research (findings)** is the major determinant of knowledge utilisation. The researchers are the sources for ideas for directing research and the users are (simply) receptacles for the research results. This means that utilisation follows a linear sequence from the supply of research advances to utilisation by decision-makers and practitioners. Within this framework, the more detailed discussions in the literature focus on which of the dimensions of the production of science could lead to more or less effective utilisation. Dimensions that have been studied over the years include content attributes (the quality and credibility of the research produced); types of research (basic/applied) and differences between research domains and disciplines.

# Models of research utilisation

## User-driven model



The basic premise of this model can be formulated as follows: **The users of research are regarded as the major sources of ideas for directing research.** This approach generates a “customer-contractor” relationship where the practitioners and decision-makers behave like “customers” who define what research they want, and where the researchers behave like “contractors” who execute contracts in exchange of payments. It should be pointed out that this is still essentially a linear sequential model, which, in this case starts with the identification of the research problem by the customers or potential users. Within the user driven model, knowledge utilisation is best explained (only) by the needs of the users. It is argued that the use of knowledge is increased when researchers focus their projects on the needs of users instead of focussing them only or primarily on the advancement of scholarly knowledge.

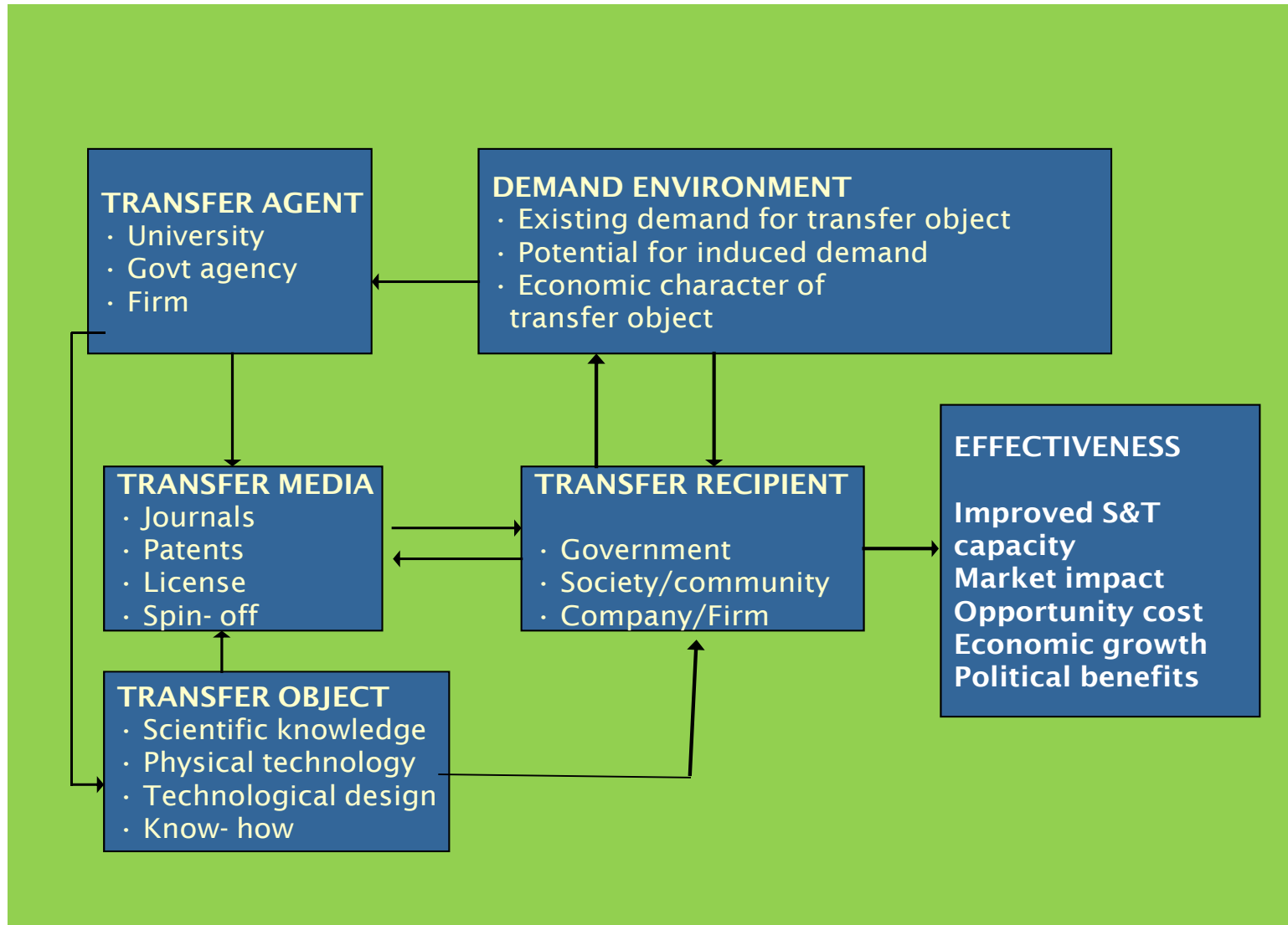


According to the network model, effective knowledge utilisation depends on various “disorderly” interactions occurring between researchers and users. The model predicts that the more sustained and intense the interactions and collaborations between researchers and users, the more likely there will be utilisation. It gives greater attention to the relationships between researchers and users at different stages of knowledge production, dissemination and utilisation. The focus now is much more on the nature of the linkages and other interactive mechanisms that bind producers and users of knowledge (as well as other potential stakeholders) into a system of knowledge and innovation. Linkage mechanisms include informal personal contacts, participation in committees, and transmission of reports to non-academic organisation. The key issue in this model is basically the “intensity” of linkage mechanisms.



Dimension	Focus	Examples
Transfer agent	The institution or organization seeking to transfer the technology	Government agency, university, firm
Transfer medium	The vehicle, formal or informal, by which the technology is transferred	License, copyright, person-to-person, formal scientific literature
Transfer object	The content and form of what is transferred	Scientific knowledge, technological device, process, know-how and specific characteristics of each
Transfer recipient	The organisation or institution receiving the transfer object	Firm, agency, consumer, user group, institution and associated characteristics
Demand environment	Factors (market and non-market) pertaining to the need for the transferred object	Price for technology, substitutability, relation to technologies now in use, subsidy, market shelters

# The Bozeman network-model





The network model of knowledge utilisation incorporates all of the features of the science push and user driven models. This allows one then to explain the dynamics of knowledge utilisation through reference to three sets of factors:

- Types of research, scientific disciplines and dissemination strategies (Expanded science push model)
- Needs and organisational interests of users (User driven model)
- Linkage mechanisms and forms of collaboration (Network model)

## Factors correlated with effective utilisation



### Basic science push model

- Types of research
- Domain differences



### Expanded science push

- (Traditional) dissemination strategies



### User-driven model

- User needs



### Network model

- Collaborations
- Interactions
- Organisational linkages
- Resource base



**Improved utilisation**



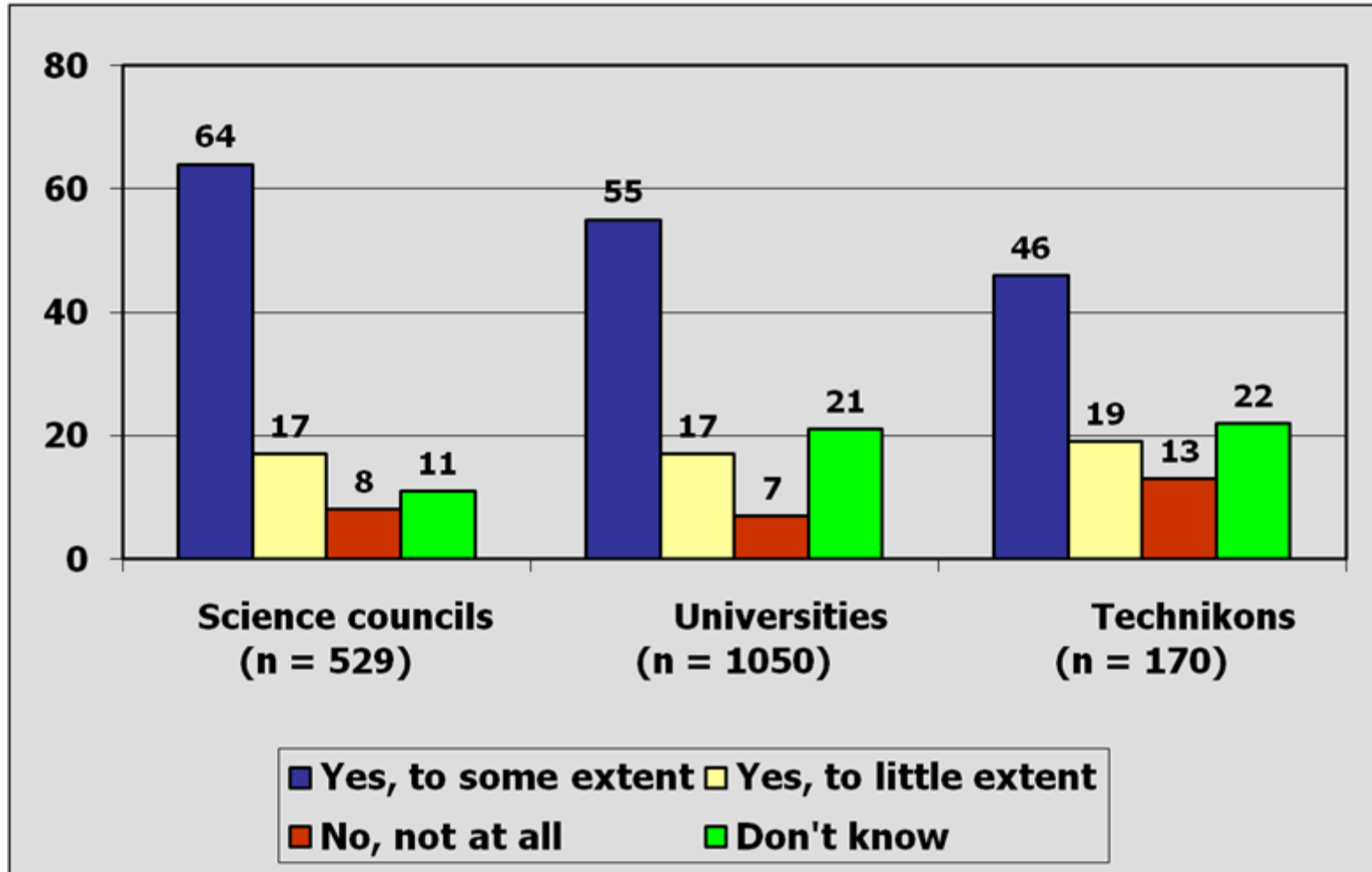


# **SOME EMPIRICAL FINDINGS**



Sector	Respondents		Projects	
	N	%	N	%
Science councils	625	<i>30</i>	539	<i>30</i>
Universities	1192	<i>58</i>	1081	<i>60</i>
Technikons	241	<i>12</i>	183	<i>10</i>
<b>Total</b>	<b>2058</b>	<b><i>100</i></b>	<b>1803</b>	<b><i>100</i></b>

## Research utilisation by sector (57% across all sectors)



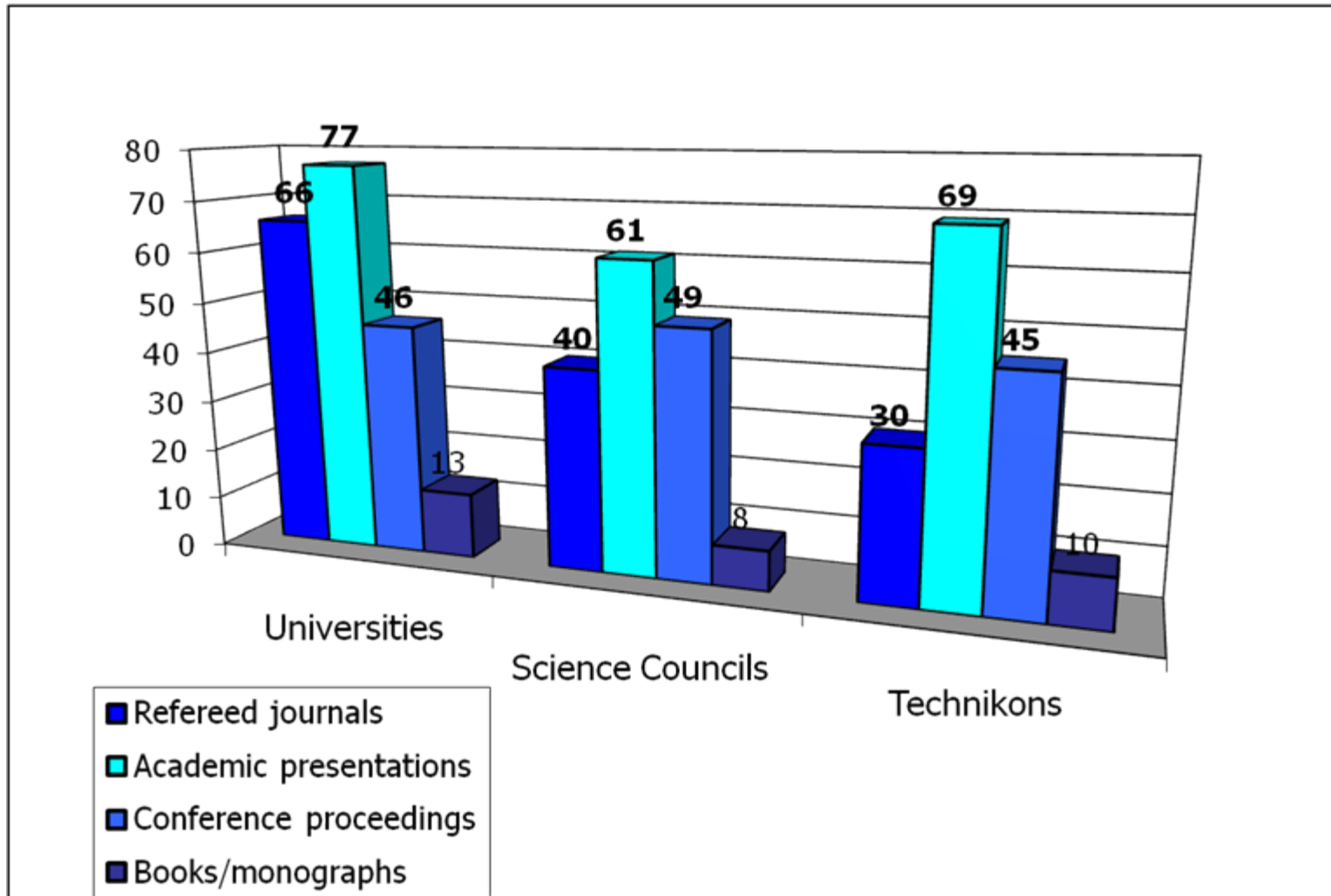
# Communication of Research Results (%)

<b>Publications and documents</b>	<b>Yes</b>
Articles in refereed scientific journals	55
Articles in refereed technical journals	7
Articles in popular journals	22
Contract reports	38
Books/ monographs	11
Chapters in books	15
Published conference proceedings	47
Written input to official policy documents	9
Technical manuals	11
<b>Patents/ licenses</b>	<b>Yes</b>
Through patenting	3
Through licensing	2
<b>Training and supervision</b>	<b>Yes</b>
Training through workshops	28
Training through coursework	21
Supervision of masters/doctoral students	33

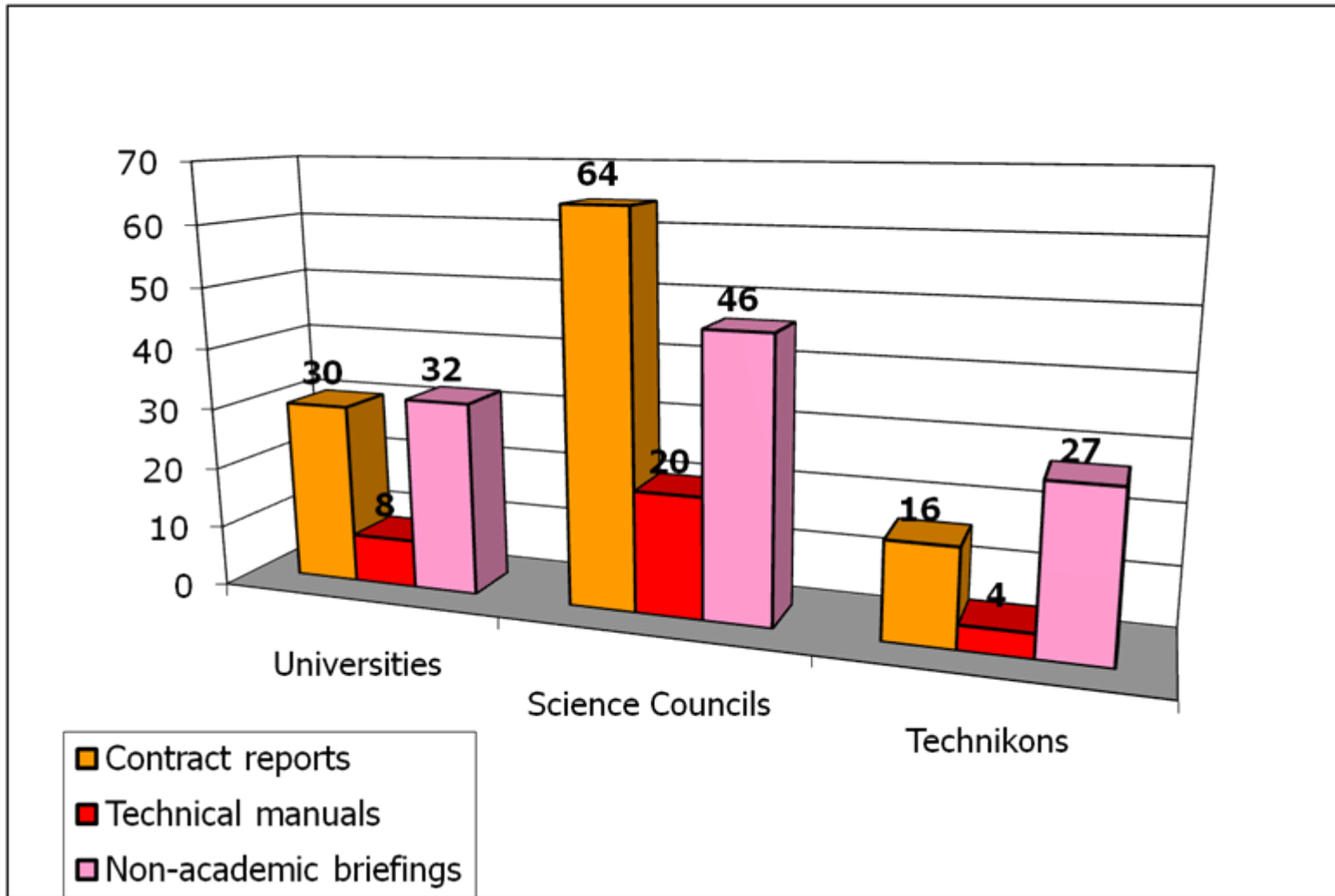
<b>Presentations</b>	<b>Yes</b>
Academic audiences	72
Non-academic audiences	35
Expert committees/ panels	25
Public hearings	6
Fairs/ exhibitions/ road shows	11
<b>Cooperative interactions/ informal meetings</b>	<b>Yes</b>
Consultations/ technical assistance to potential users	34
Personnel exchanges/ secondments	18
Informal meetings with potential users/ teams	40
<b>Organisational structures</b>	<b>Yes</b>
Through participation in consortia	12
Through science parks	1
Through spin-off companies	3
Through technology transfer offices	3
Through technology incubators	1
Other	3

% calculated out of a total of 1803 projects

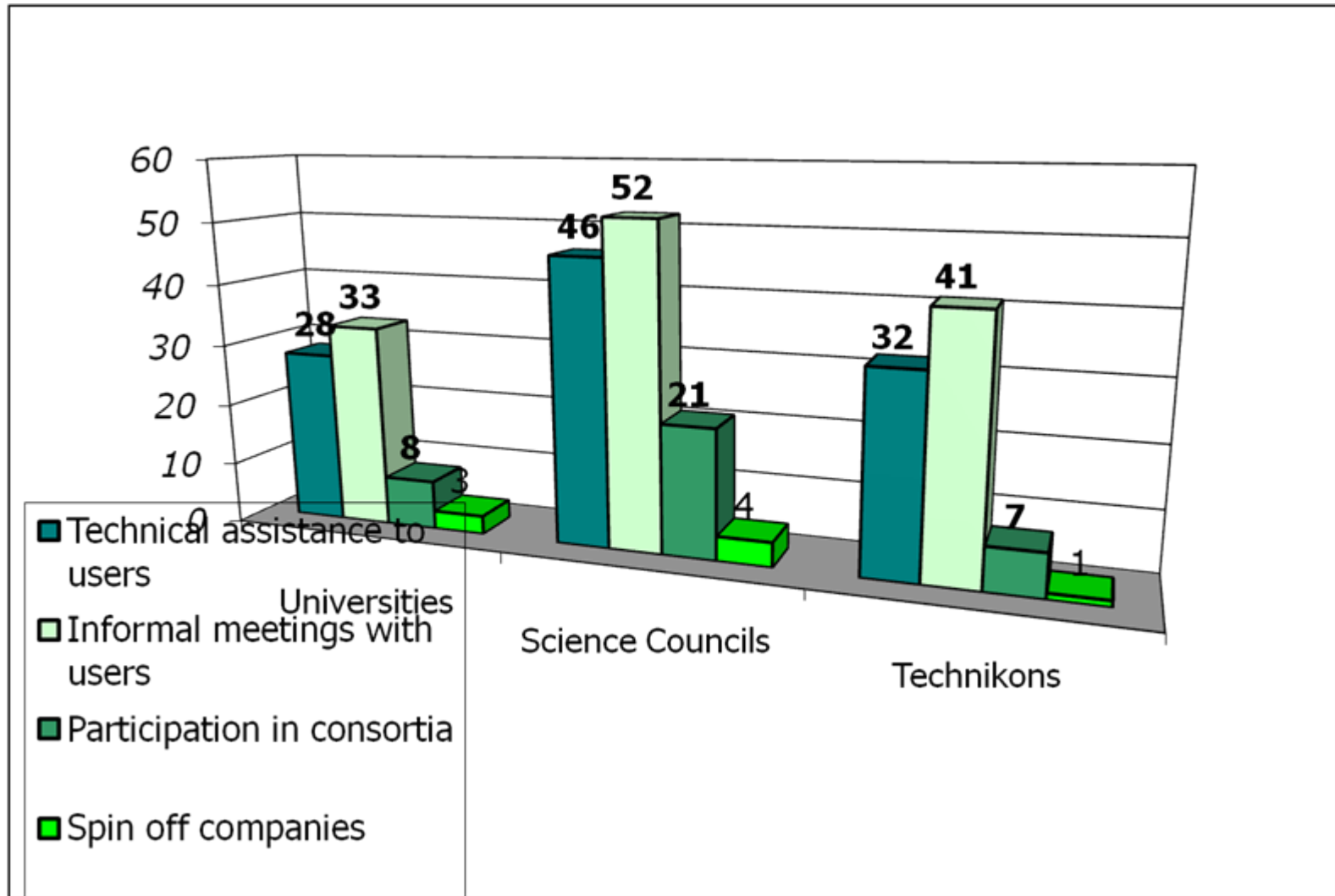
## Academic modes of dissemination



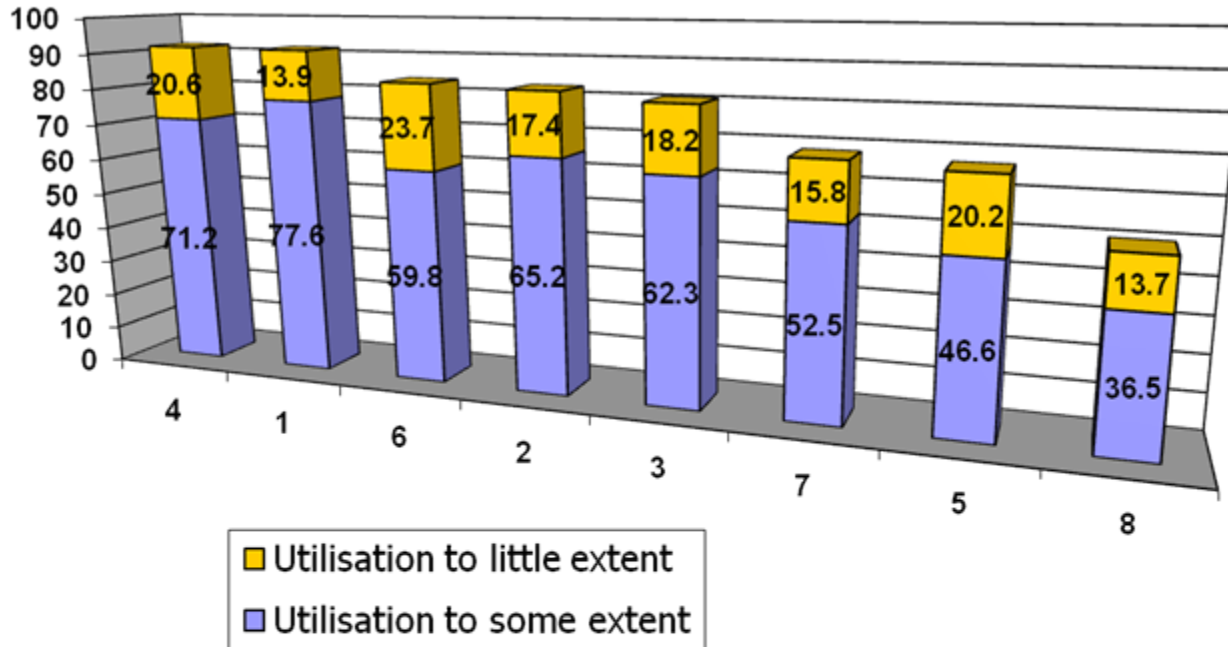
## User-driven modes of dissemination



## "Network" modes of dissemination



# Dissemination modes and reported utilisation of research



- 1 = Above average on all three modes of dissemination
- 2 = Above average on academic-driven and user-driven only
- 3 = Above average on academic-driven and network-driven only
- 4 = Above average on user-driven and network-driven only
- 5 = Above average on academic-driven only
- 6 = Above average on user-driven only
- 7 = Above average on network-driven only
- 8 = Below average on all three modes of dissemination





Utilisation of knowledge/research is optimised under the following conditions (in descending order of importance):

- Where multiple modes of dissemination are employed
- Where scientists collaborate: both across fields and across institutions
- Where R&D projects have reached a minimum size and scope (funding)
- Where there is an experienced principal project leader



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**The End**



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