CTO survey results
Fall 2019

Pekka Torvinen, Spinverse Oy

Content

CTO
FOrUM

The survey respondents comprehensively represent the Finnish industry

Respondents by company size

- Small (<50 employees) 31%
- Medium (50-250 employees) 16%
- Mid-Cap (>250 employees but turnover <300M€) 17%
- Large (>250 employees and turnover > 300M€) 37%
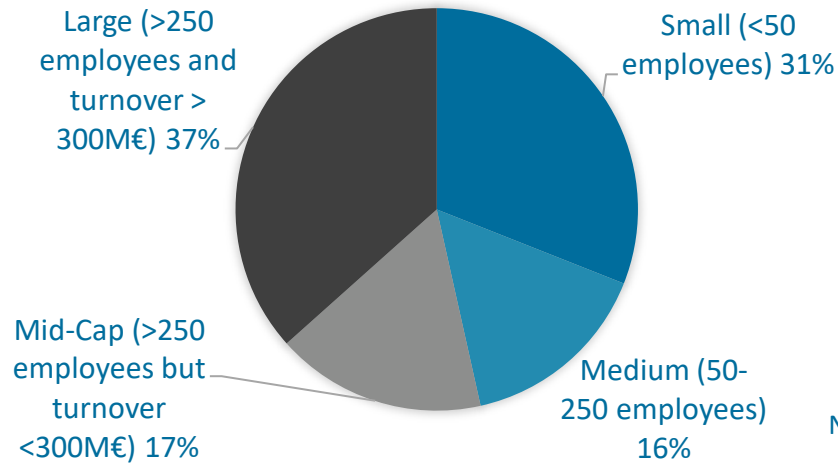
Respondents by industry

- Chemical Industry 9%
- Forest, Pulp and Paper 6%
- Energy and Environment 7%
- Mining and Metallurgy 6%
- Construction 3%
- Metal and Mechanical Engineering 11%
- Electronics and ICT 37%
- Life Sciences and Healthcare 3%
- Food and Nutrition 6%
- Other, please specify 14%
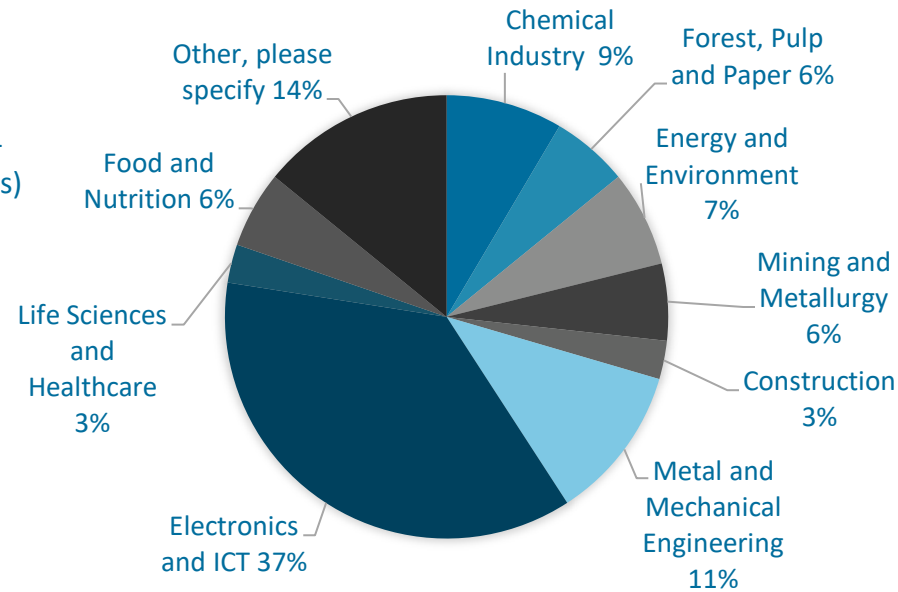
The size of the annual R&D budget

- We are in the phase of developing our first product and have no revenue yet...
- Undefined (24%)
- 2-5% of revenue (19%)
- 6-9% of revenue (13%)
- 10-15% of revenue ; (10%)
- >15% of revenue (23%)

72 responses from CTOs

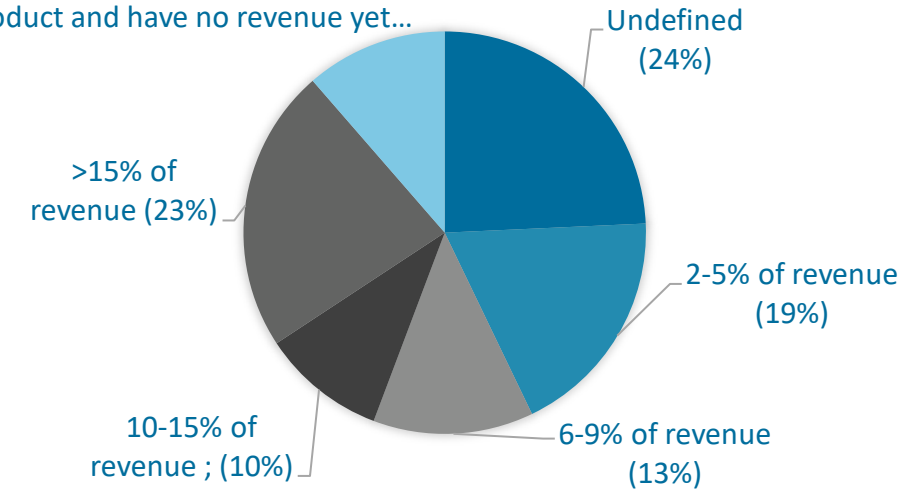# Most have reported the R&D budgets to increase or stay at the same level

- Companies increasing their R&D budgets looks to be at a stable level according to 2016-2019 data and 2020 expectations
- Growing pressure in R&D budgets in some areas; increasing share of the respondents reported the budget to **decrease** compared to last year

Changes to R&D budget (2016-2020)

Legend: ■ 2016 ■ 2017 ■ 2018 ■ 2019 ■ 2020 (estimate)

Categories: Increase, Stay the same, Decrease, No opinion

CTO FORUM
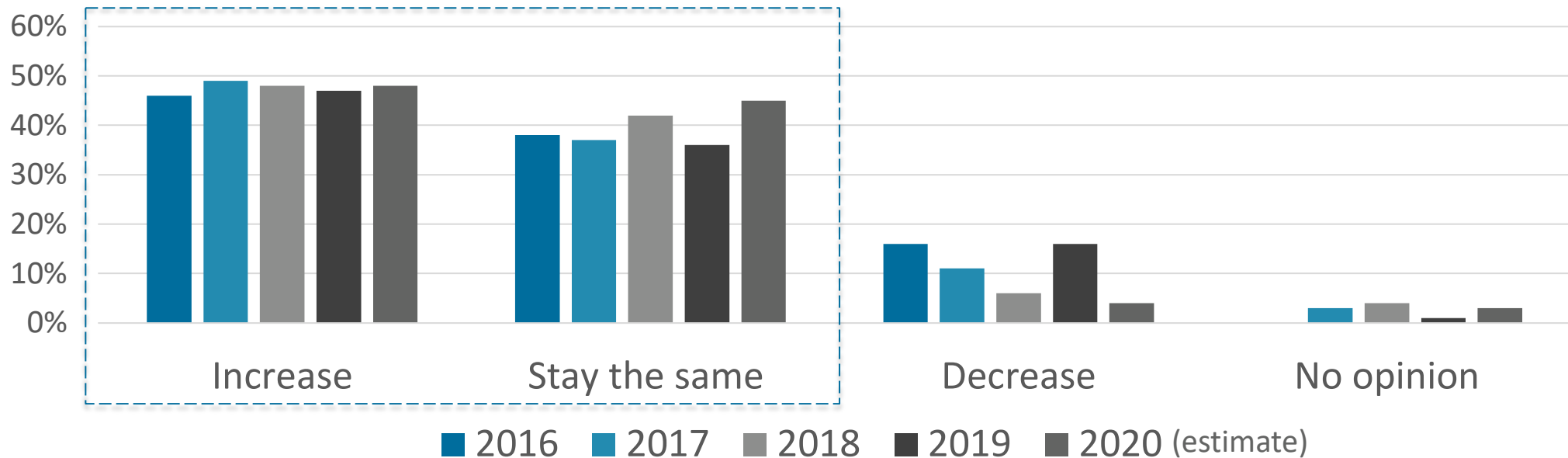
No drastic changes seen in the yearly R&D figures – positive outlook for the future

- Most of the CTOs report that the number of **new products and services have stayed at the same level (47%) or increased (44%)** in 2019 compared to previous year
  - 59% of CTOs expect this to **increase for the year 2020**

- Most of the CTOs (41%) see that the number of **patents and use of other IPR instruments have stayed at the same level for 2019** compared to previous year
  - Majority (46%) of CTOs expect this to **stay at the same level** and 35% expect this to increase **for the year 2020**

- Number of **new internal R&D projects have stayed at the same level (44%) or increased (42%) during 2019**
  - Majority (51%) of CTOs **expect this to stay at the same level also for the year 2020**

- The majority of CTOs (49%) reported that **the number of new publicly funded R&D projects have stayed at the same level for 2019** compared to previous year
  - Majority (57%) of CTOs expect this to **stay at the same level also for the year 2020**

- The majority of CTOs (51%) reported **the number of R&D personnel to have increased during 2019**
  - 53% of CTOs expect this **to increase for the year 2020**

CTO FORUM

Data on the Move

Data on the move - Main themes of the CTO survey 2019
Data sharing and cooperation in ecosystems is progressing in Finnish industries

Data as a strategy

82% of companies are utilising data from internal and external sources as an integral part of **strategy** formulation

Operating in ecosystems

The majority of companies (87%) operate in ecosystems and **60%** are **moderate to highly active** in ecosystems
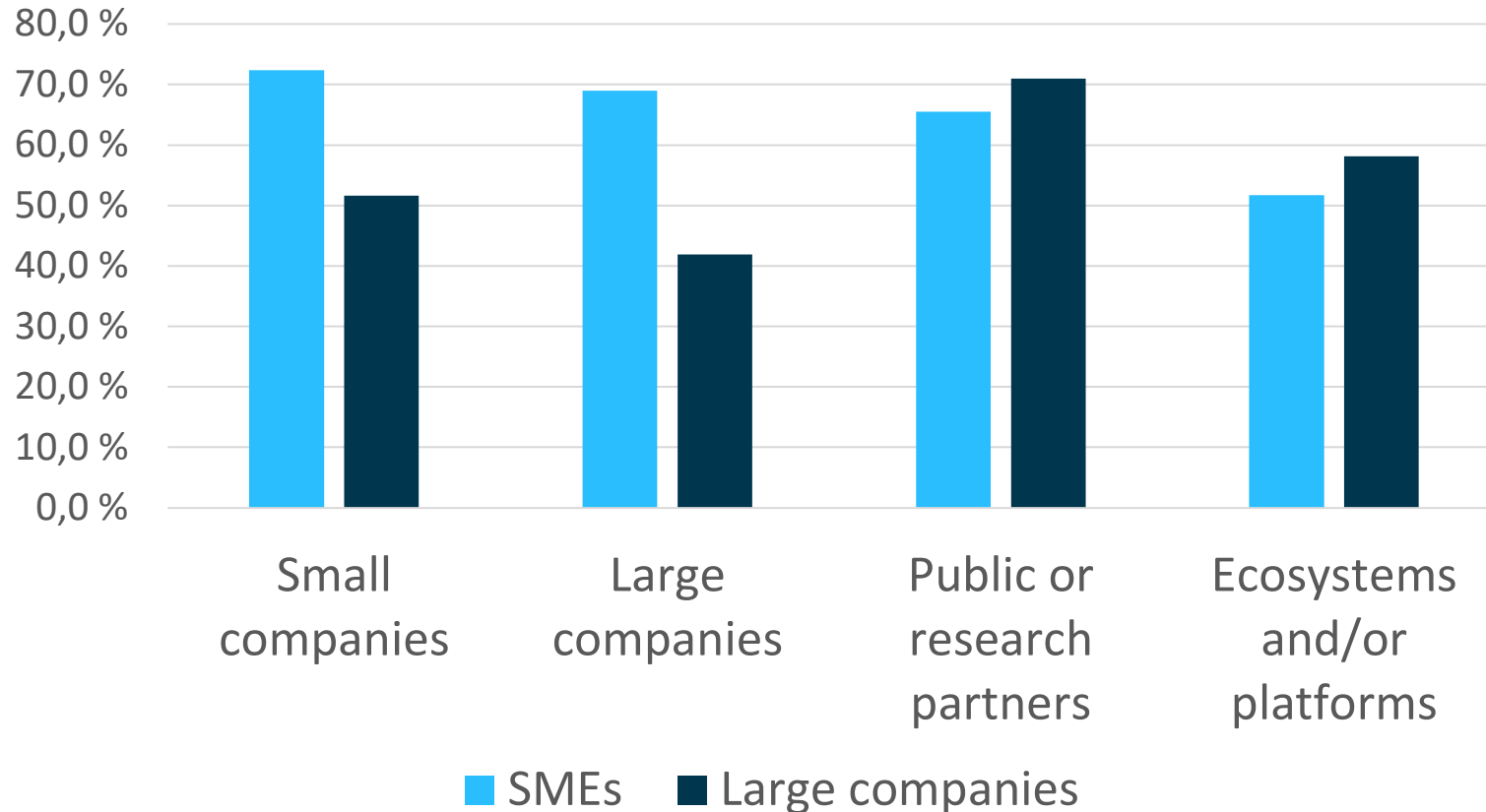
Data sharing

83% of CTO's report to utilise data **from external sources & partners**. 100% of **SMEs** utilise external data sources compared to only 69% of **large companies**. 68% utilize data from **the public sector**

CTO FORUM

SMEs are more active in sharing data between companies than large companies in general

Data sharing cooperation

Bar chart with y-axis from 0,0 % to 80,0 %:

- **Small companies**: SMEs ~72%, Large companies ~51%
- **Large companies**: SMEs ~69%, Large companies ~42%
- **Public or research partners**: SMEs ~65%, Large companies ~71%
- **Ecosystems and/or platforms**: SMEs ~51%, Large companies ~58%

Legend: ■ SMEs ■ Large companies

- Large companies share more data with **public and research partners** than SMEs (65% vs. 71%) but share less data **amongst themselves and other companies compared to SMEs**

Most of the companies are active in ecosystems...

Activity level in ecosystems

Legend: SMEs (light blue), Large companies (dark blue)

CTO FORUM
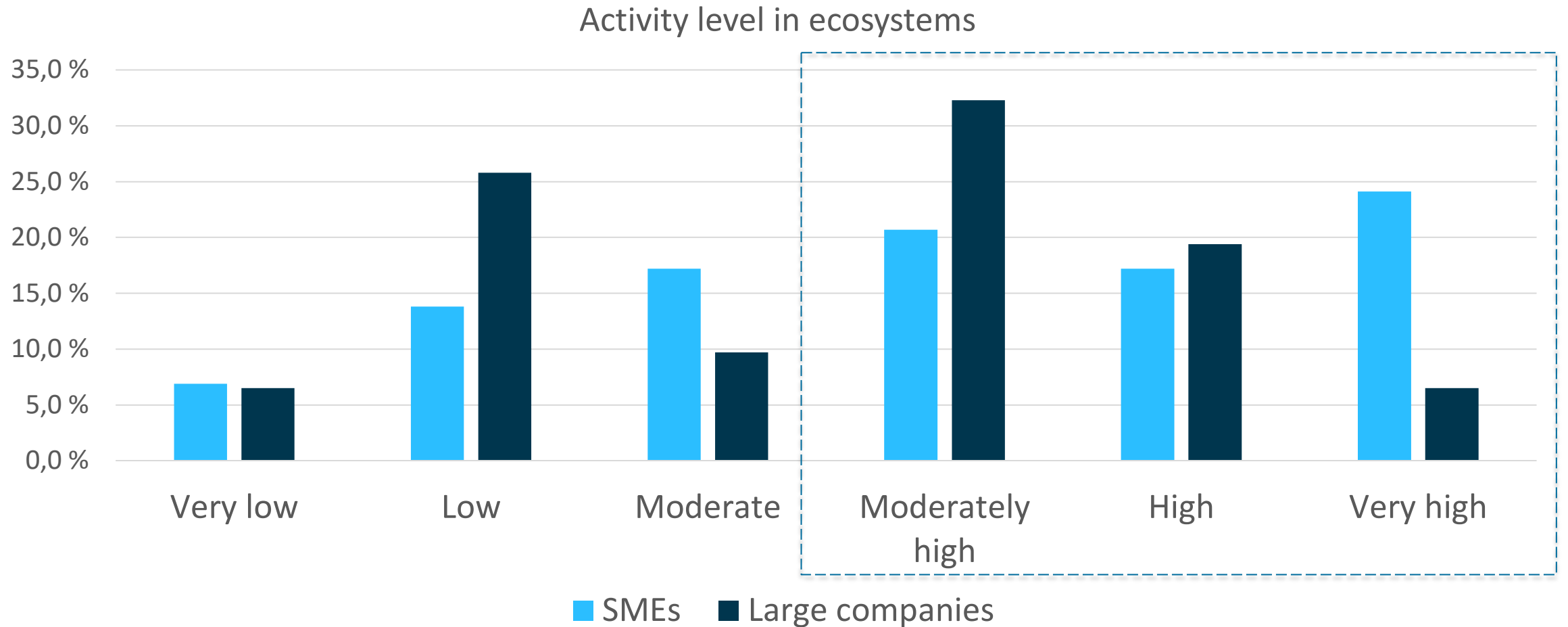
...however, only 12% of CTOs feel that they can openly share data with value network partners

Openness to share data with value network partners
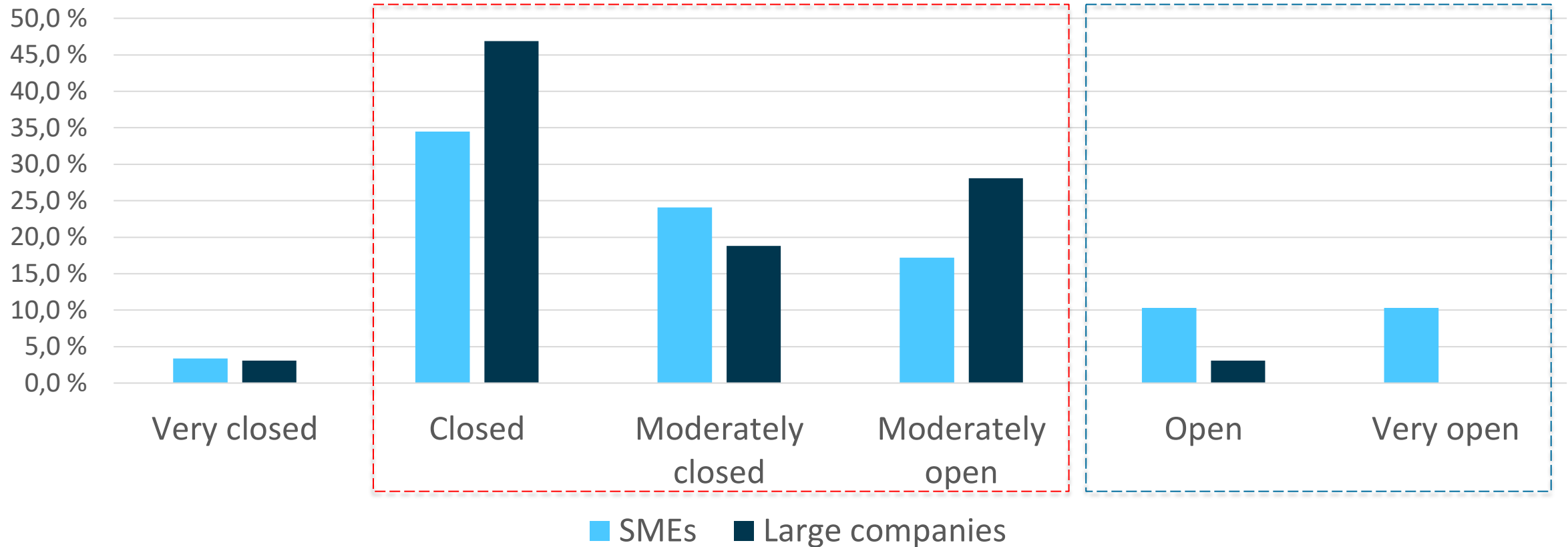
CTOs feel that issues regarding ownership and IPR sharing hinder the exploitation of data and commercialization

- 72% of CTOs in large companies feel that issues regarding ownership and IPR sharing hinder the exploitation of data and commercialization
- SMEs do not fare any better as 76% of them feel the same

How issues regarding ownership and IPR sharing affect the exploitation of data and commercialization
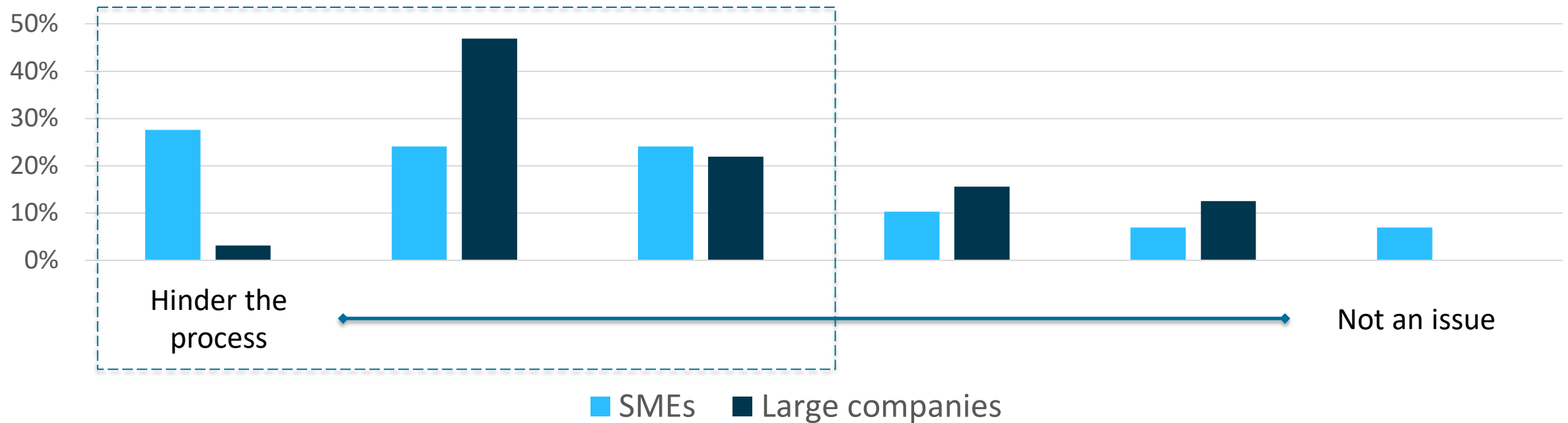
SMEs seem to be more confident in their capability to exploit external data compared to larger companies

31% of large companies rate their capability to utilise data 'moderately high' whereas...
...31% of SMEs rate their capability to utilise data as 'high'

Capability to exploit external data in operations

SMEs   Large companies
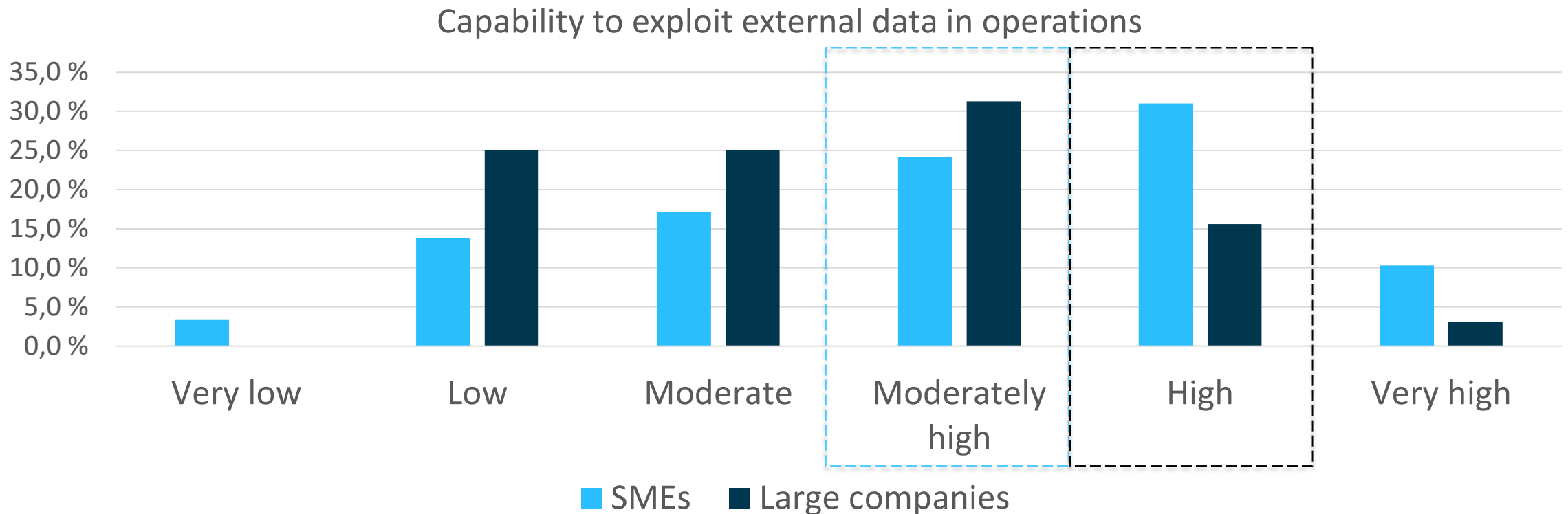
SMEs seem to be more confident in their position in utilization of data in comparison to their competitors

- 59% of large companies feel they are on par with competitors while only 18% feel they are ahead of their rivals
- Around 10% of SMEs and large companies feel they are behind of the competition in data utilisation

SMEs
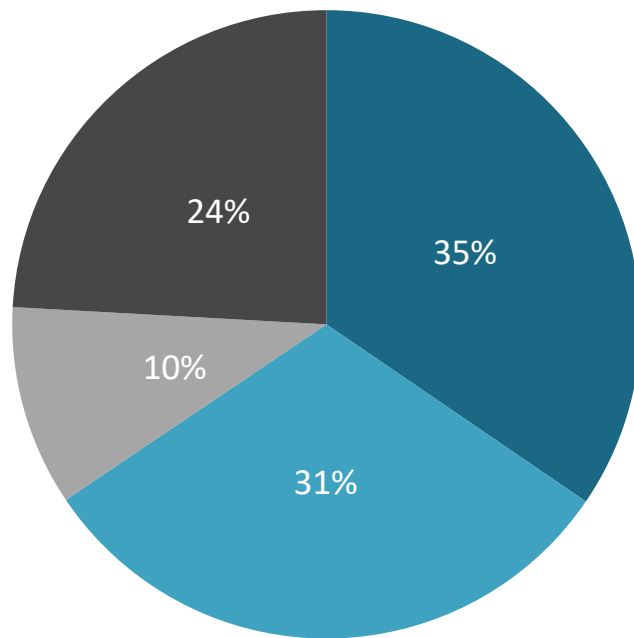
- Our company is ahead of others in data utilisation
- Our company is at par with others
- Our company is not as far in the exploitation of data as others
- We have not done comparisons to others

35%
31%
10%
24%

Large companies

- Our company is ahead of others in data utilisation
- Our company is at par with others
- Our company is not as far in the exploitation of data as others
- We have not done comparisons to others

18%
59%
9%
14%
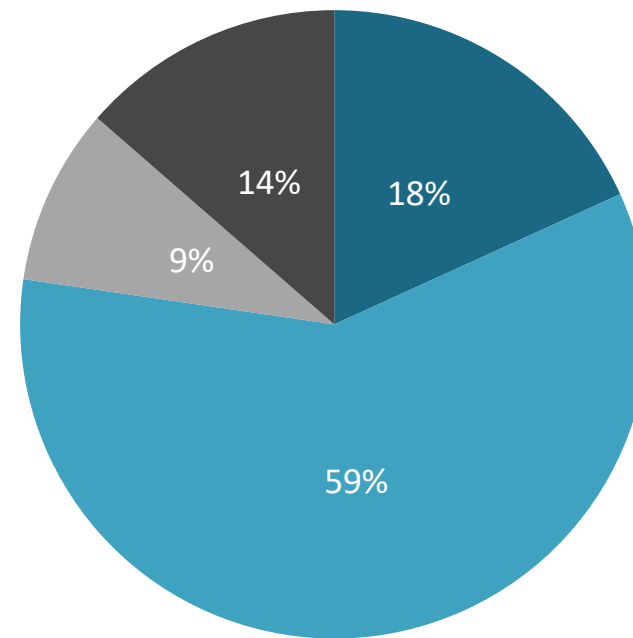
External and public data are mainly used for developing core products and services

- There is a greater focus on enhancing the customer experience as well
- Public data is also used more for Business Intelligence compared to external data

Use of external and public data in different business areas
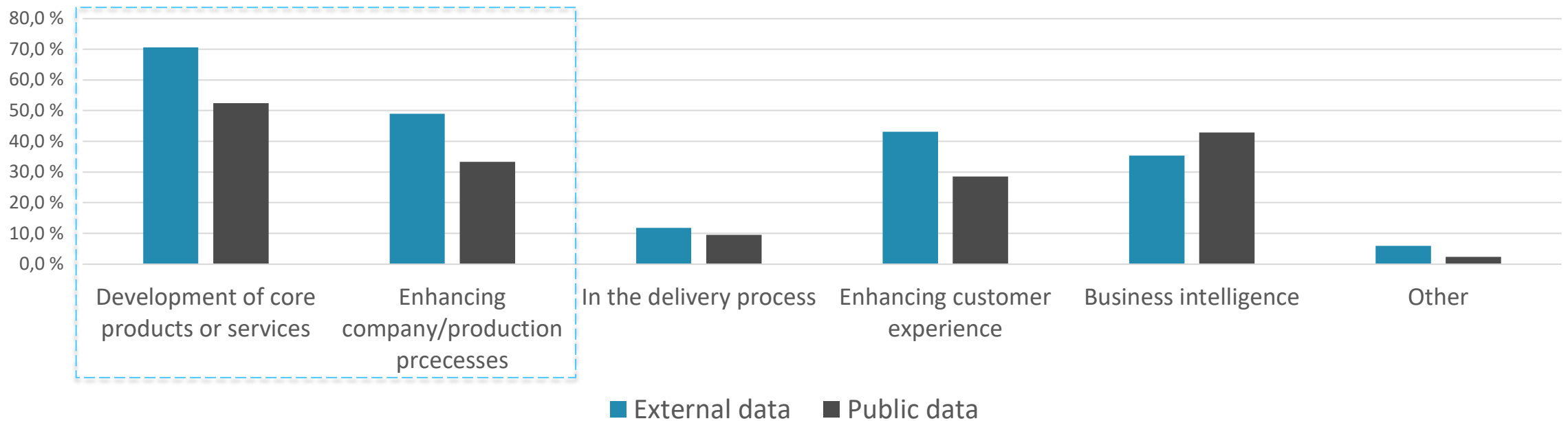
More focus in the customer experience is expected compared to internal process development

- Both SME's and larger companies are focusing on improving the customer experience in the near future
  - Large companies seem to be focusing more on developing internal processes as well
  - However, co-creation with partners is also recognized as one of the main focus areas

Focus in the data strategy for the next 12 months

SMEs Large companies
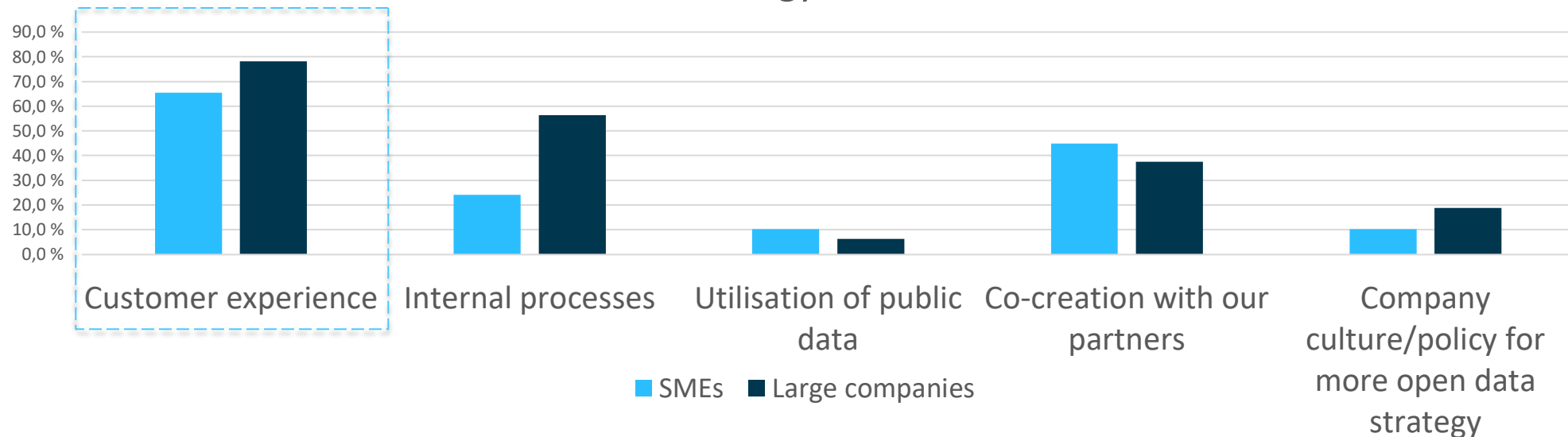
The many faces of innovation and the changing role of CTOs

The results highlight **three main reasons to invest in data utilisation**:

New business solutions (3)   **New competitive advantages (1)**   **New solutions to customers (2)**

Profit Model	Network	Structure	Process	Product Performance	Product System	Service	Channel	Brand	Customer Engagement

CONFIGURATION   OFFERING   EXPERIENCE

New business opportunities (1) **More versatile products & services (2)** **Improved customer experience (3)**
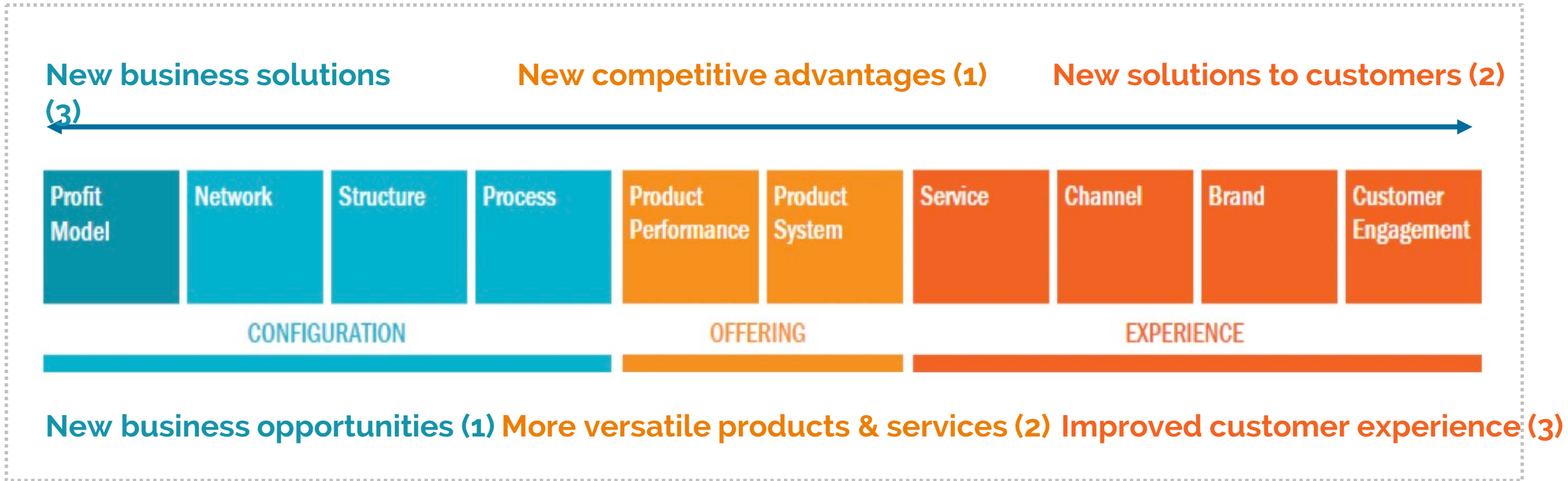
Data utilisation has **resulted in following competitive advantages**

CTO FORUM

We have been focusing on getting data to the Cloud...
NOW is the time to focus on turning this data into value!
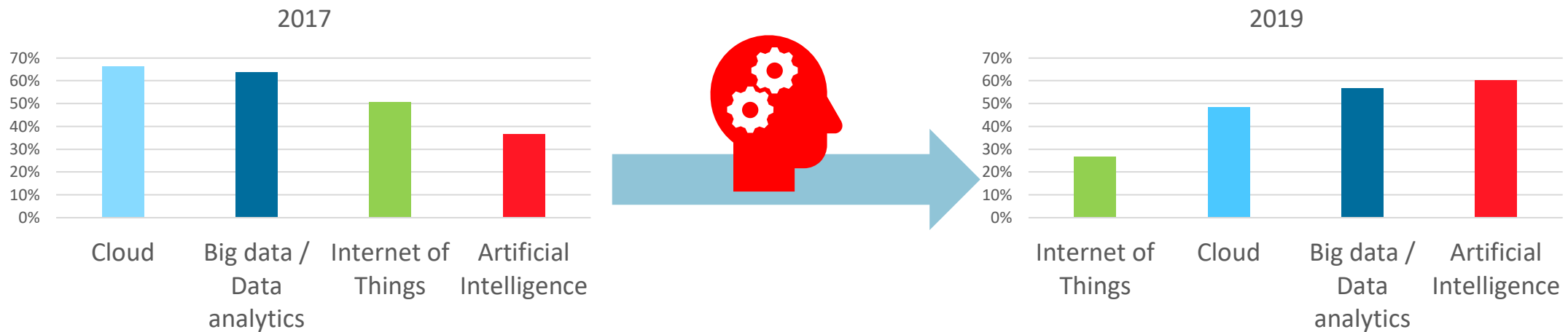
2017

2019

- CTO Forum 2017 focused on **digitalisation where Cloud and big data were seen a the most important focus areas**. NOW that the data is in the cloud, the CTO Forum 2019 results show that companies are focusing more and more on **AI**

- THIS data can now be turned into **actionable strategies and value**

What actions or support do the Finnish companies and public entities need for improving the exploitation of external data?

Avoid misuse of data and IPR or sensitivity issues

Semantic search for public data.

Agile national programs

Access to data and data sources

Better clarity on what and how public data can be utilized.

Clear IPR- and data ownership rules

More defined ecosystems

Data from public sources outside of Finland

Flexible solution providers

Open and documented APIs

Openness

Genuine willingness to find win/win-solutions

Support

Creating more open atmosphere.

Funding for research field

Initiatives to create industry clusters where data can be shared openly

Definitions and modelling of data

EU wide standards

Experts

Cross industry discussions

Shelf life of data

Sharing policy and platforms

Managed Data platform

Culture

Networking and knowledge sharing, support for partnering

New data services and platforms

Cloud use

Practical use cases

Positive examples

Change of culture

Effective ecosystems

Better IPR

Better understanding of data and its utilization.

Examples of good practices

Many large companies need policies and company culture changes to be able to take part in data sharing.

AI application support and skills

Co-operation with the external data providers (customers)

The right mindset

Availability

Data classification

Data analysis

Public 5G networks