

Exploring The added value Of **Smart offices**

P5 presentation

27 – 06 – 2019

MSc Management in the Built Environment (MBE)

Jeremie Oudot

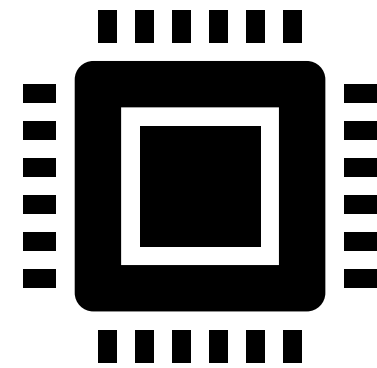
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THE PRESENTATION

- **Introduction on smart offices and real estate markets**
- **Quick introduction into the research problem and goals**
- **Overview of used methodology**
- **Research findings**
- **Conclusions**

TECHNOLOGY

For decades technology has influencing how we live



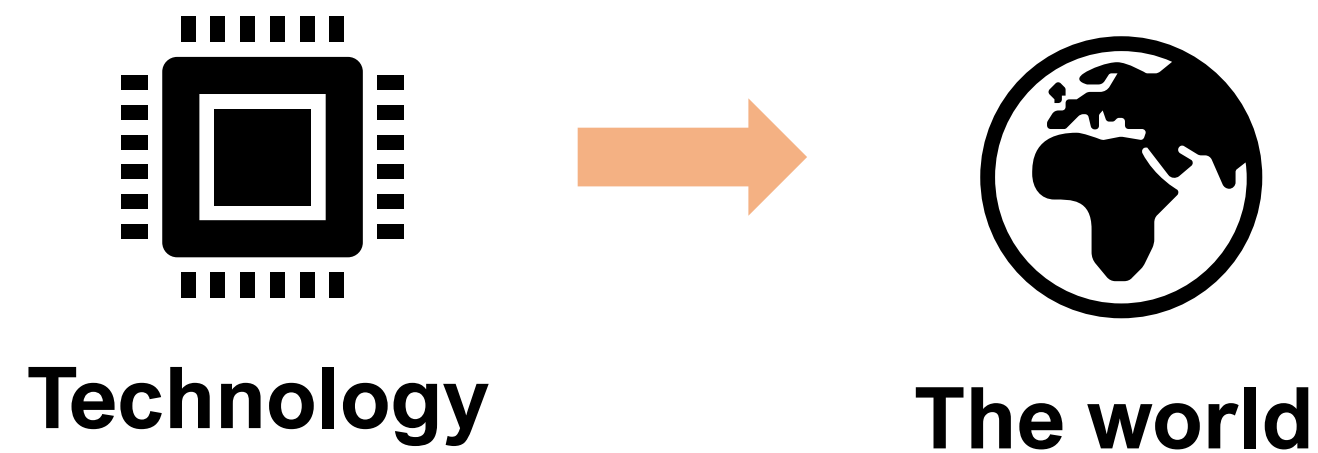
Technology



The world

TECHNOLOGY

For decades technology has influencing how we live



- 1900's: The radio
- 1980's: The internet
- **2000's: Start of Digital Age (Google)**
- **2010's Smart technology**

SMART TECHNOLOGY

How smart technology is transforming the industrial world

How smart home technology can make your life a whole lot easier

The Technologies Building The Smart Cities of The Future

How smart technology can lead to healthier lives

Is Smart Technology Making Us Dumb?

Yes and no: there are reasonable arguments on both sides of the question

How Smart Technologies Are Transforming Life & Business Now!

Five "Fast Trends" We Cannot Ignore Anymore

How Smart Shelf Technology Will Change Your Supermarket

SMART TECHNOLOGY

*“Smart technology **enables** devices to be wirelessly connected and operated interactively and autonomously”*

SMART TECHNOLOGY

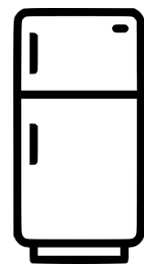
From:



Phones



Watches



Fridge

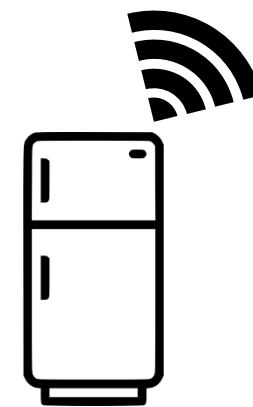
To:



Smart phones



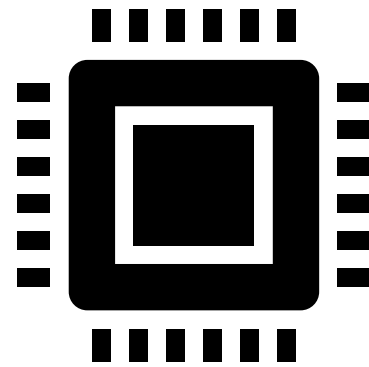
Smart watches



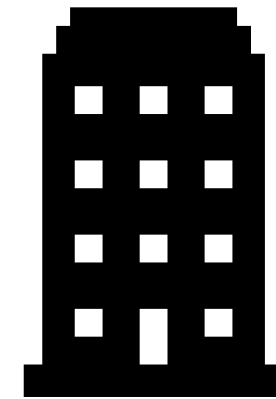
Smart fridges

IN REAL ESTATE

*In real estate we go from **Office buildings** to.....*



Smart Technology



Office buildings



1980's

<https://www.archdaily.com/tag/introverted-design>

The Edge

The Smartest Building in the World
*Inside the **connected** future of architecture*



OFFICE SPACE ENABLED BY TECHNOLOGY

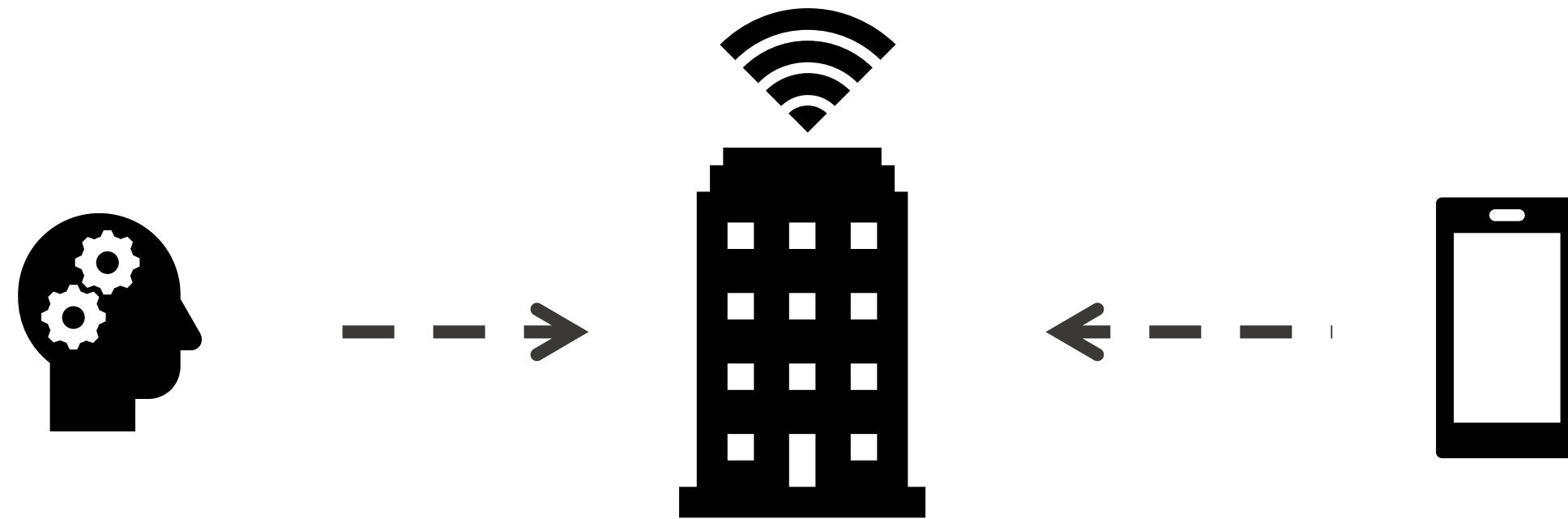


<https://www.bloomberg.com/features/2015-the-edge-the-worlds-greatest-building/>

<https://www.cnacmatrix.com/content/how-iot-internet-things-changing-smart-office-future>

SMART OFFICES

*“Wirelessly connected **OFFICE BUILDING** that can be operate interactively and autonomously”*



SMART OFFICES

It's a new and **innovative** concept in real estate;

It is still **under-researched** academically;

But, it is seen as the next generation of offices (Buckman et al. 2014)

THE REAL ESTATE MARKET

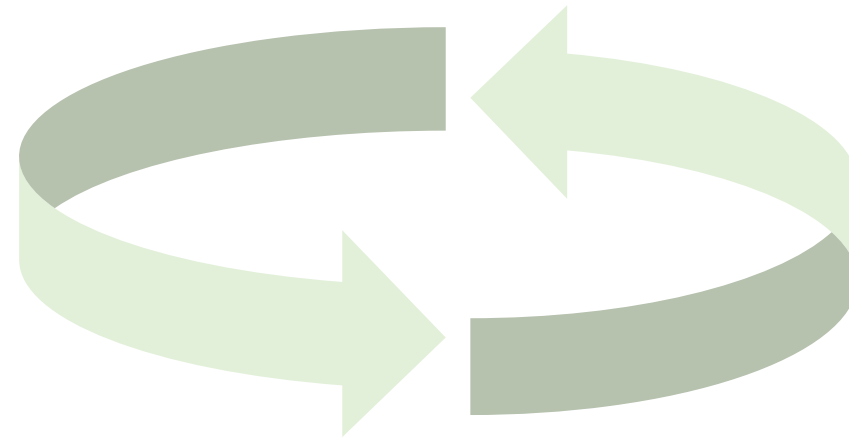
First of all, lets sketch the context of this research

SUPPLY AND DEMAND

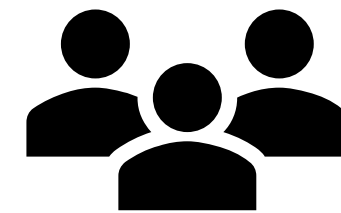
Supply



Represented by the
investor



Demand



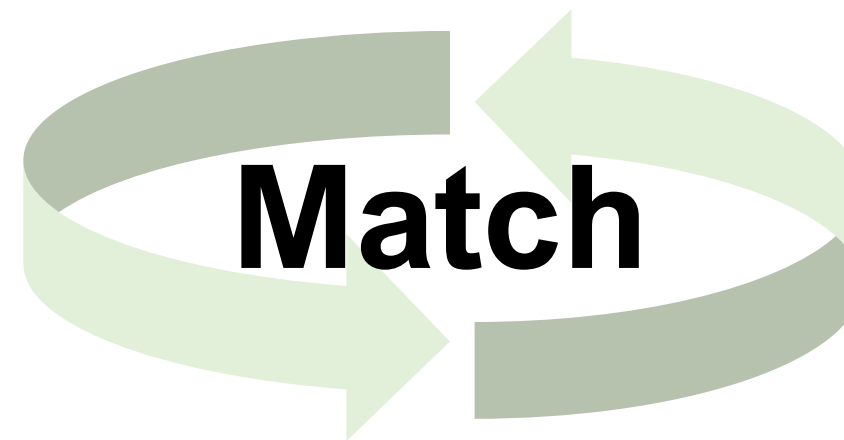
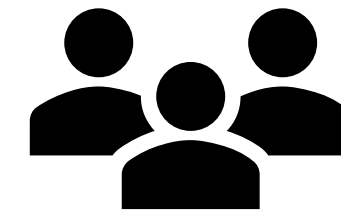
Represented by the
users

SUPPLY AND DEMAND

Supply



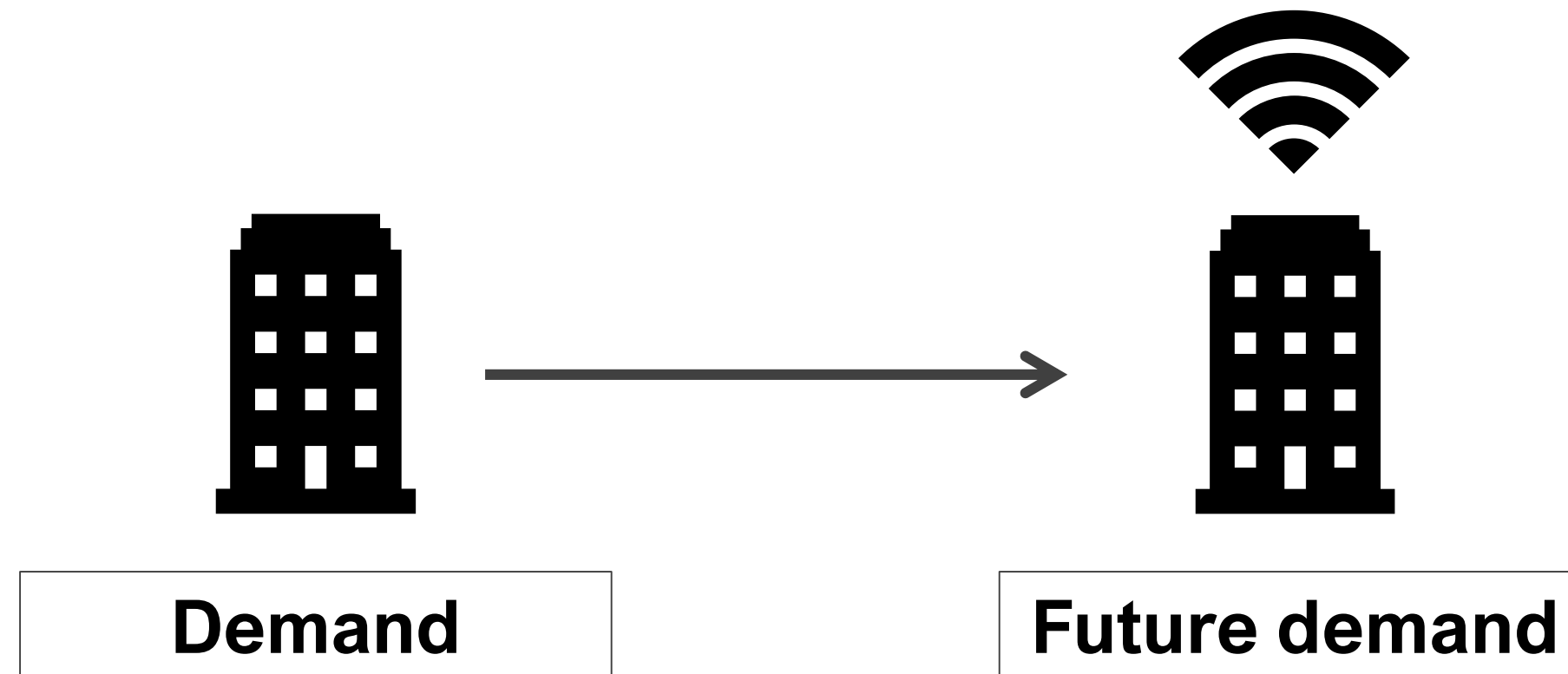
Demand



*A good match between supply and demand equals
a healthy market*

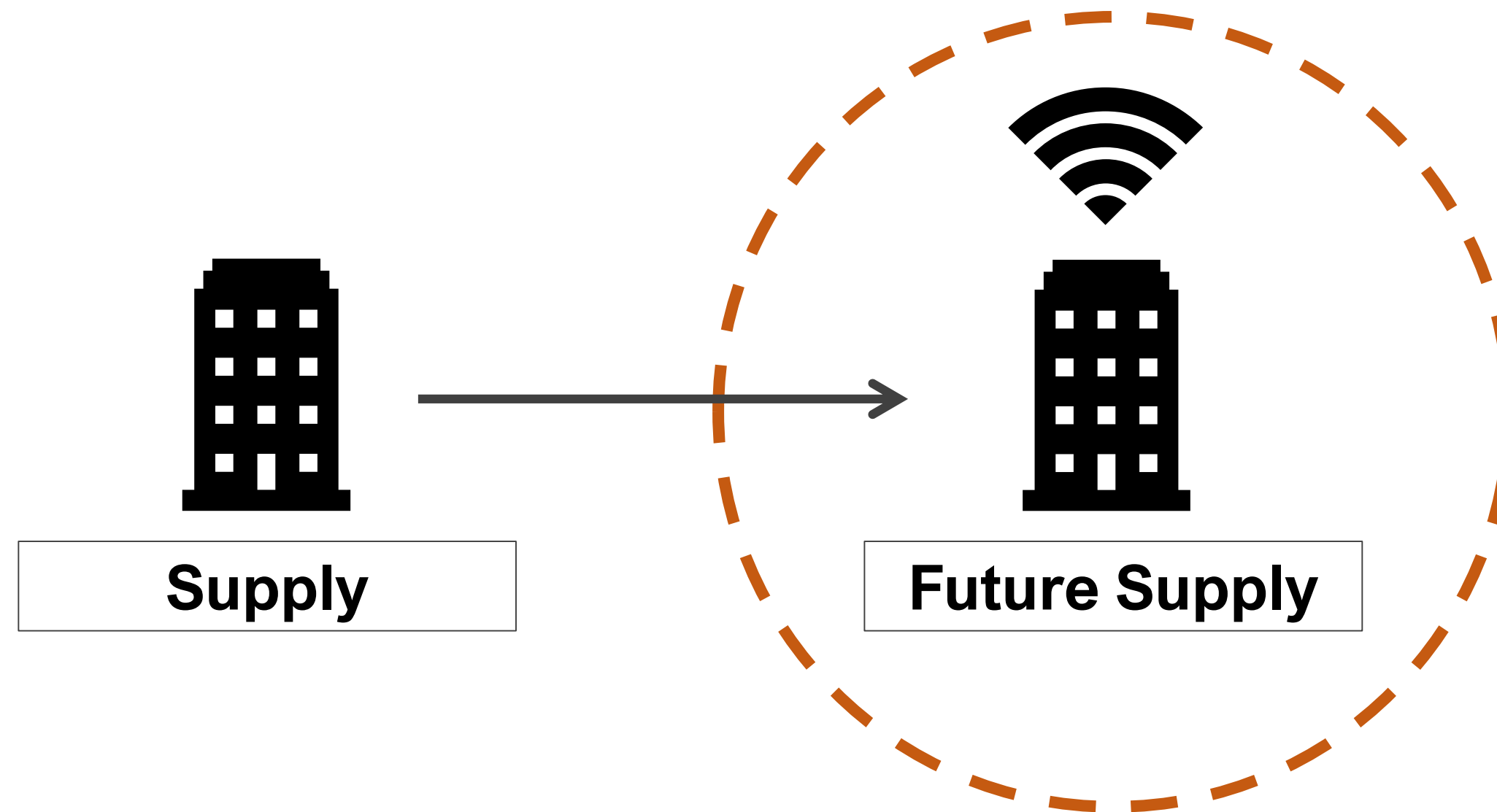
CHANGING DEMAND

When there is a demand for smart office space....



CHANGING DEMAND

*....there must be a **supply** of office space.*

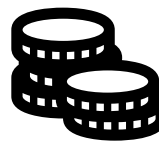


SUPPLY AND DEMAND

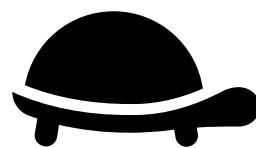
Supply



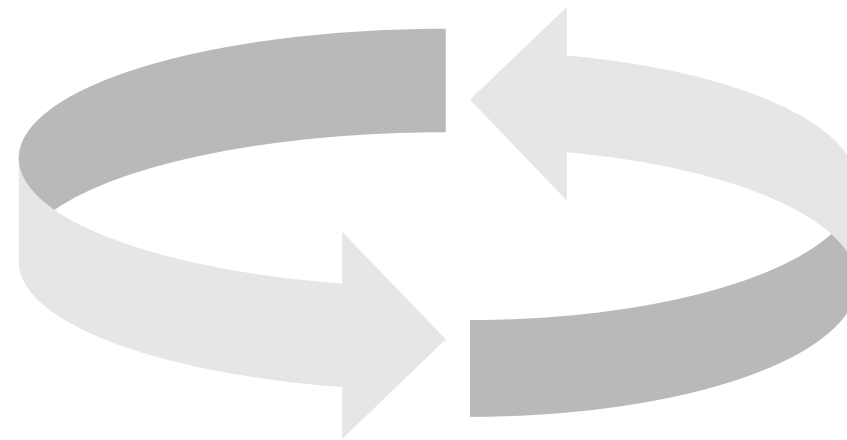
Represented by the investor



Capital constraints & Risks



Static; Slow at adopting new innovations



Demand



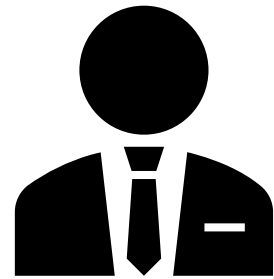
Represented by the users



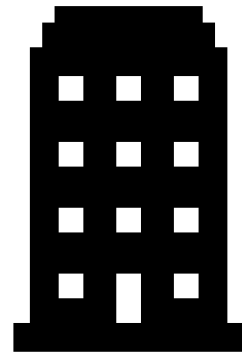
Fast at adopting new innovations

PROBLEM STATEMENT

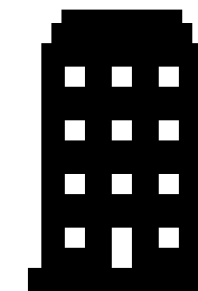
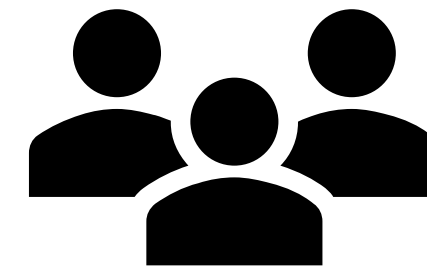
Supply



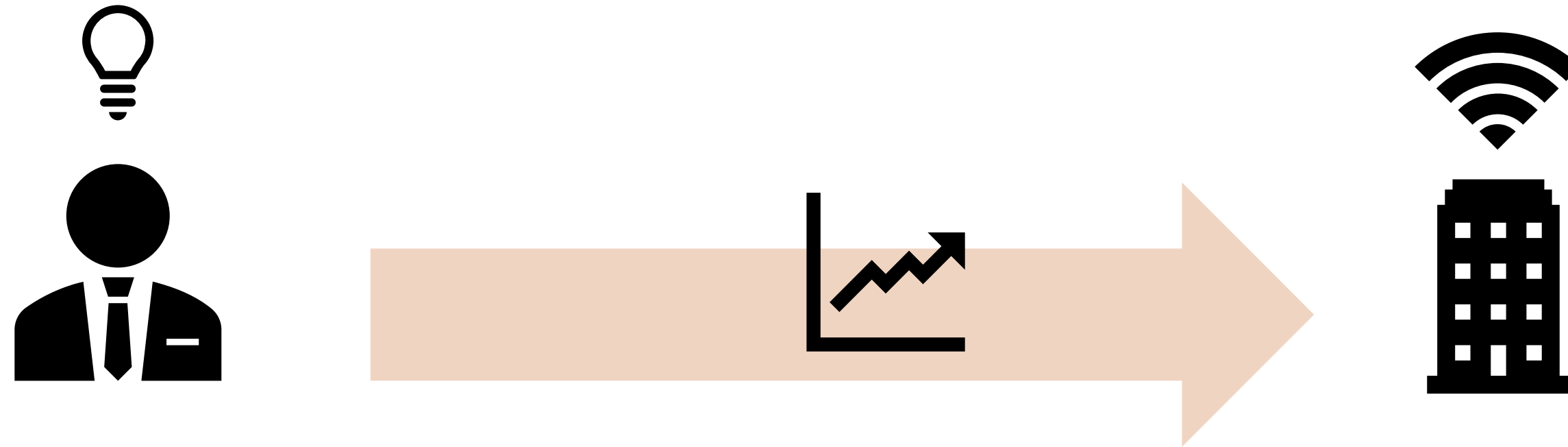
Technology is seen as a **risk** due to the benefits being **unclear**.



Demand



MAIN AIM



Show the benefits and value of smart offices
smart offices to...

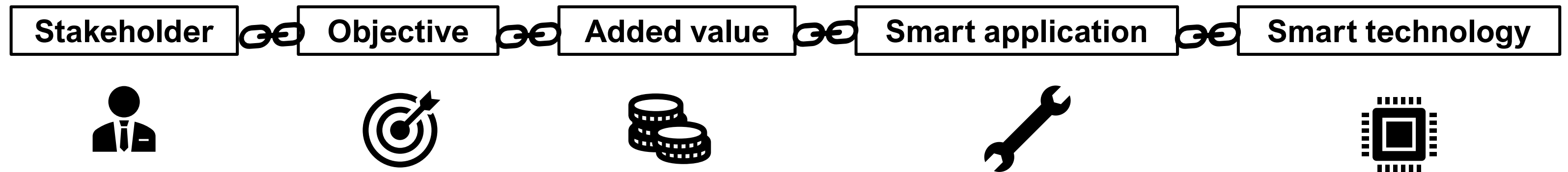
RESEARCH QUESTION

*“How can **smart technology in office buildings** provide **added value to real estate investors?**”*



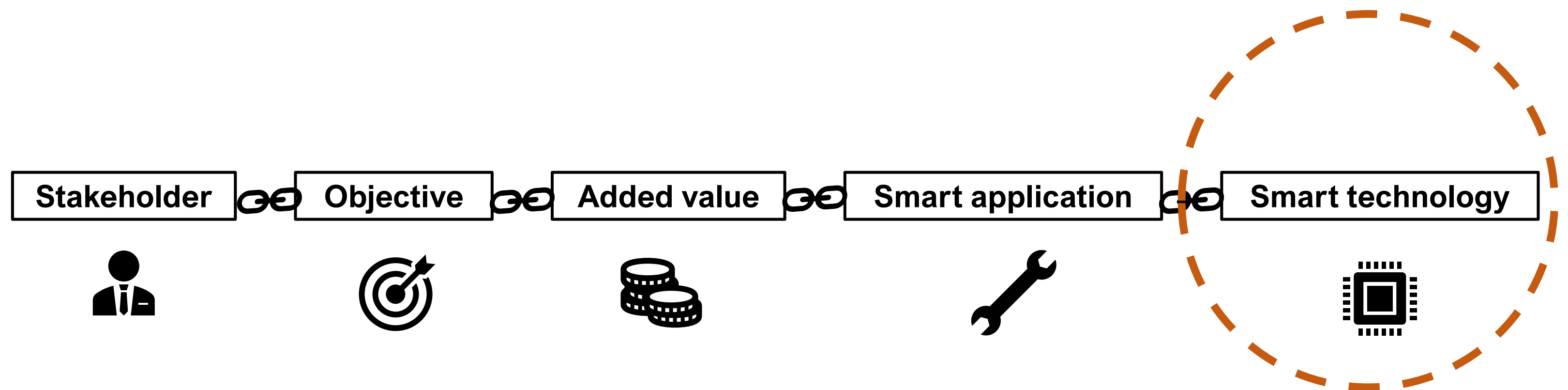
THE END PRODUCT

A smart value map that connects smart technology, added value and the investor



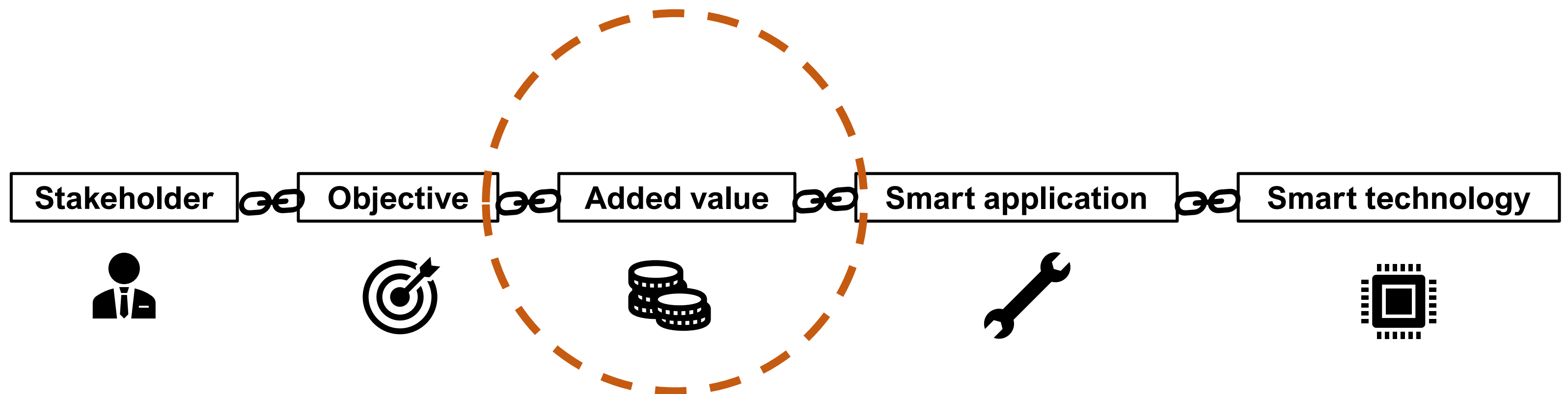
THE END PRODUCT

*A smart value map that connects **smart technology**, added value and the investor*



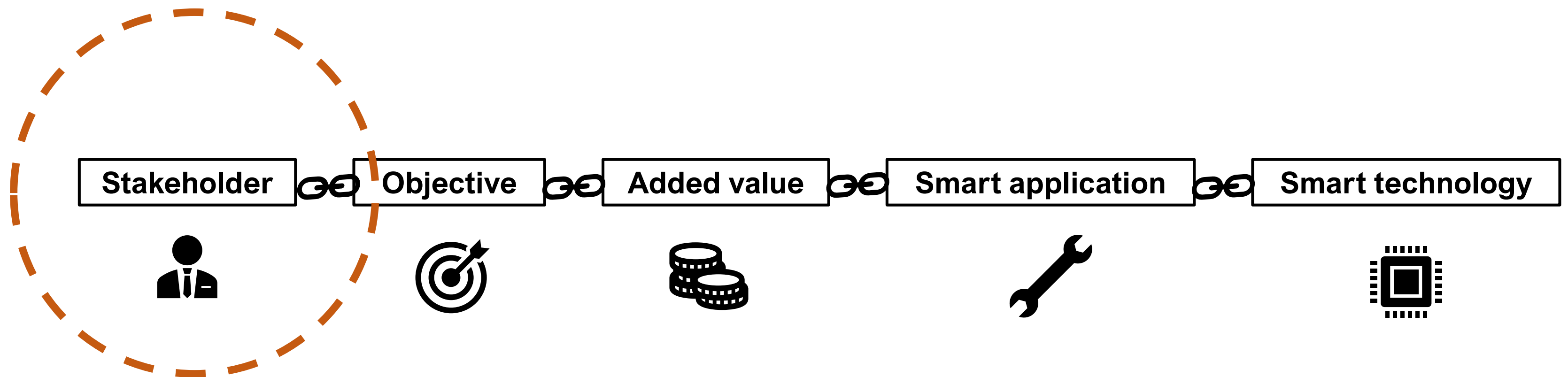
THE END PRODUCT

*A smart value map that connects smart technology, **added value** and the investor*



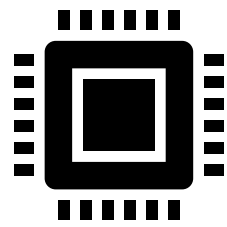
THE END PRODUCT

*A smart value map that connects smart technology, added value and
the investor*



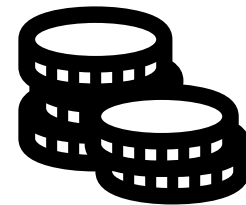
METHODOLOGY

To research the three topics and construct the Smart Value Map.



Smart technology

What is smart technology?



Added value

What is value?



**Investor &
Other stakeholders**

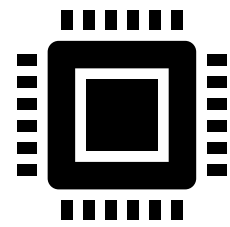
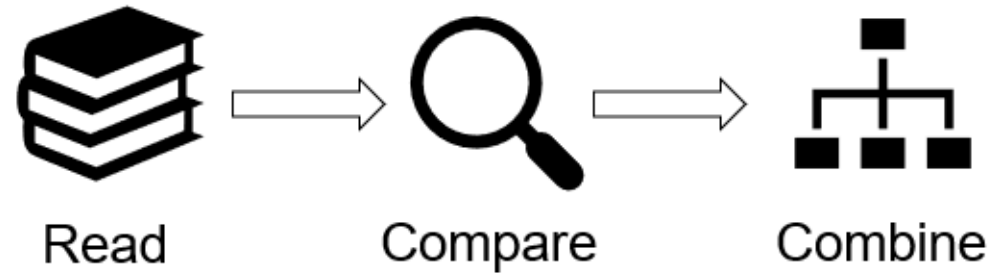
What do they want?

METHODOLOGY

Method	Literature review	Case studies	Interviews	Expert panel
Aim	Create a theoretical base on the reserach topics	Study real life examples and enrich the theory and draw conclusions.	Gather inisghts for the case studies throught involved stakeholders	Find consensus on importance of different values and smart applications
Results	Theoretical framework combining research topics	List of used smart applications and drivers of smart buildings.	Specific information on the different case studies and drivers for smart buildings.	Consensus on what values and smart applications are most useful and important

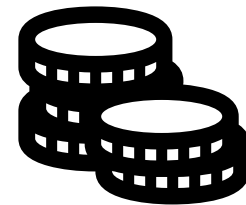
Image 10. Method overview. Own illustration. Icons by PowerPoint.

LITERATURE REVIEW RESULTS



Smart technology

What is smart technology?



Added value

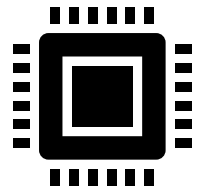
What is value?



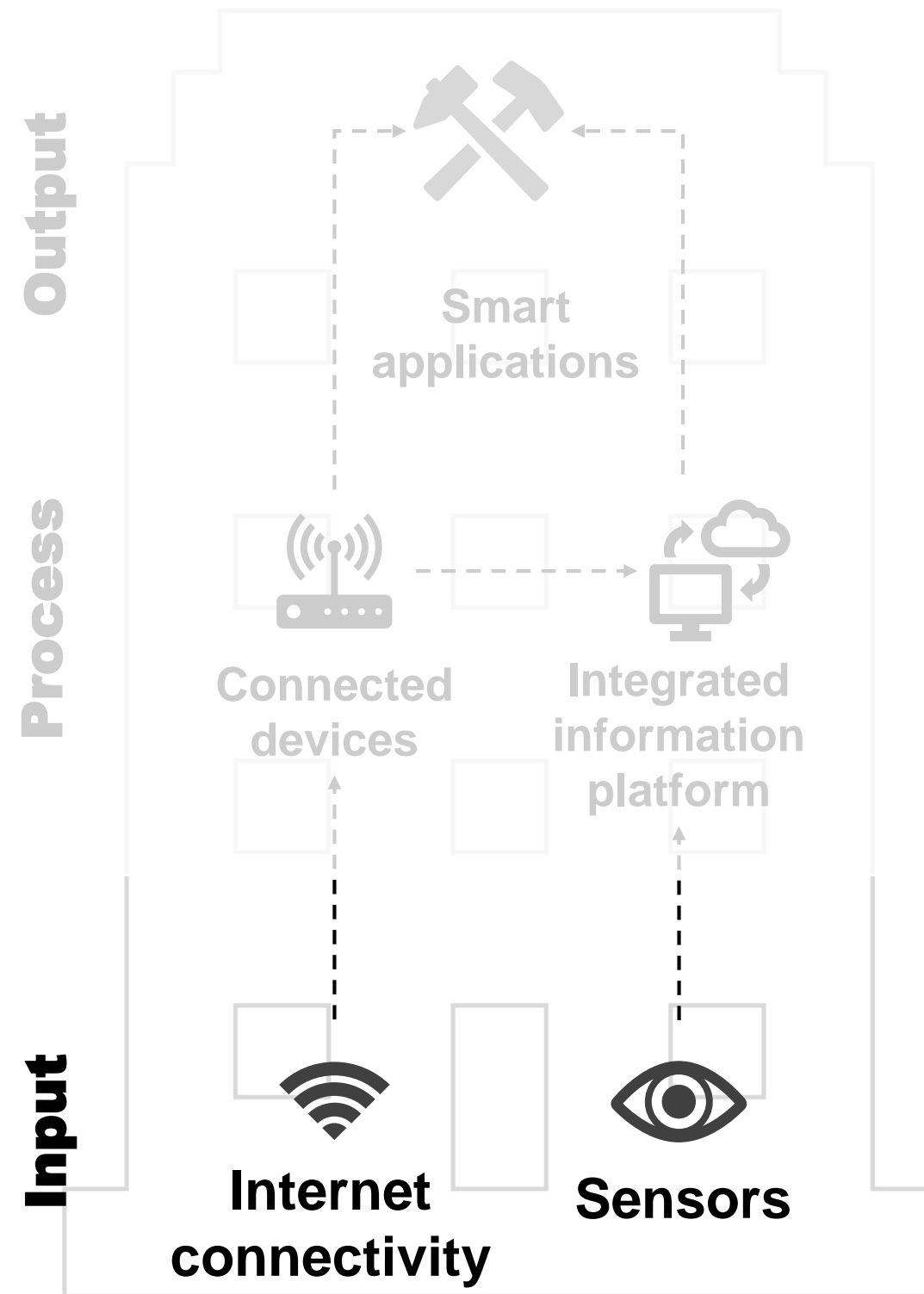
**Investor &
Other stakeholders**

What do they want?

LITERATURE REVIEW RESULTS



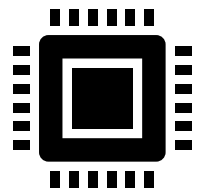
Smart technology



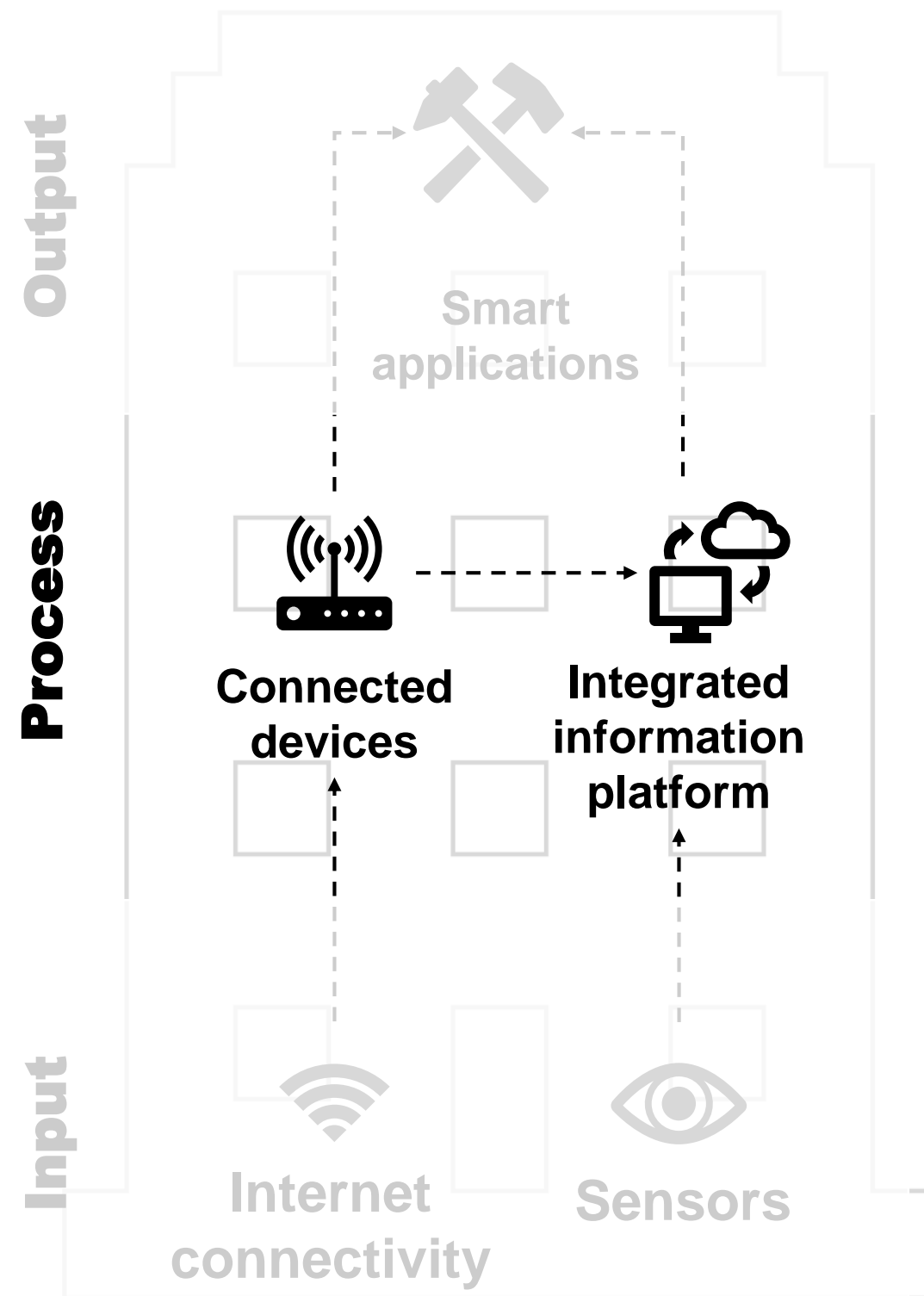
Collect and send data

1. Communications network
2. Sensors

LITERATURE REVIEW RESULTS



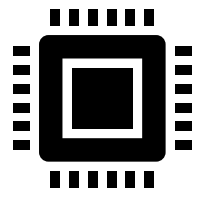
Smart technology



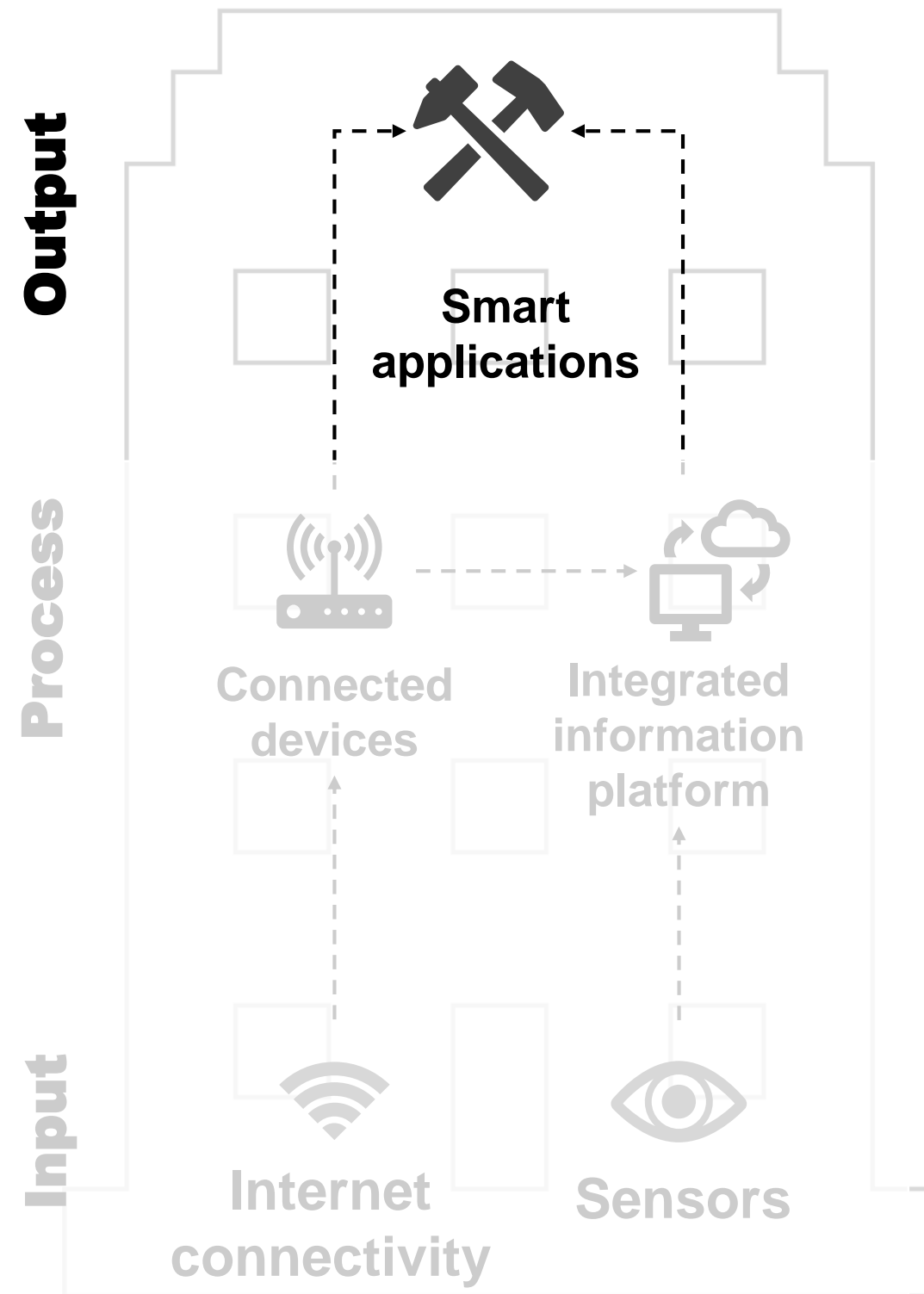
Data processing

1. Create
2. Communicate
3. Aggregate
4. Analyse
5. **Act**

LITERATURE REVIEW RESULTS



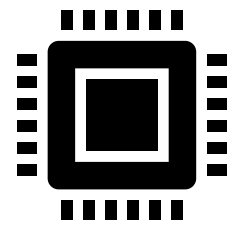
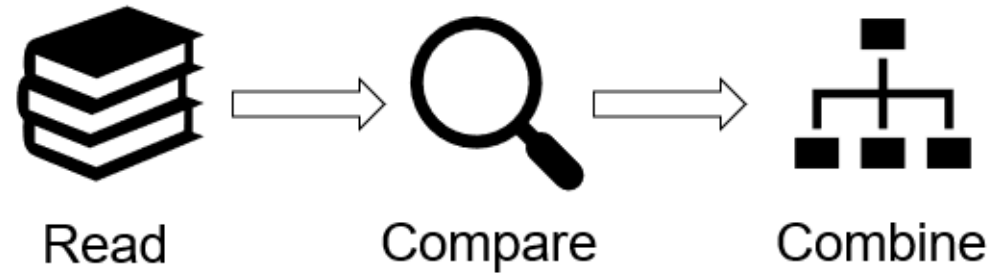
Smart technology



Smart applications

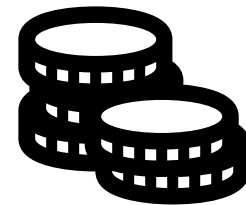
1. Act

LITERATURE REVIEW RESULTS



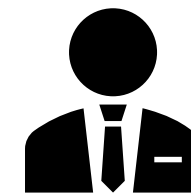
Smart technology

What is smart technology?



Added value

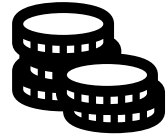
What is value?



**Investor &
Other stakeholders**

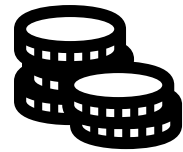
What do they want?

LITERATURE REVIEW RESULTS



Added value

Common factors that **provide value** depending on the **goals of the stakeholder**



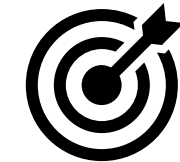
- Adaptability
- Risk
- Cost reduction
- Asset Value



- Sustainability



- Health
- Satisfaction
- Productivity
- Culture

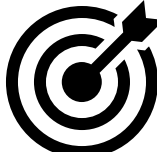


- Branding
- Innovation

LITERATURE REVIEW RESULTS



Added value



Branding

- High quality surroundings
- Sustainability
- Innovation
- Exclusive character



Productivity

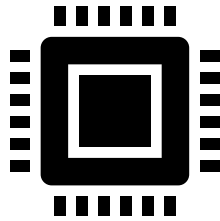
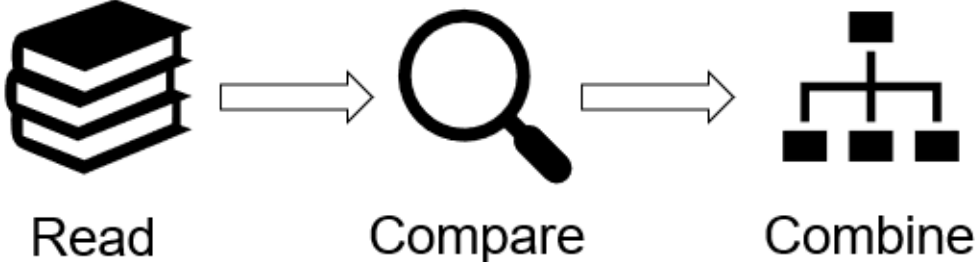
- Perceived control over environment
- Indoor environment
 - Thermal
 - Air quality
 - Lighting



Sustainability

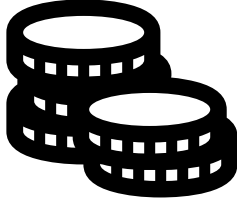
- Lower carbon emission
- Lower energy consumption
- Lower water consumption

LITERATURE REVIEW RESULTS



Smart technology

What is smart technology?



Added value

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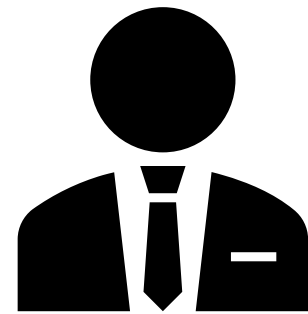
Investor & Other stakeholders

What do they want?

LITERATURE REVIEW RESULTS



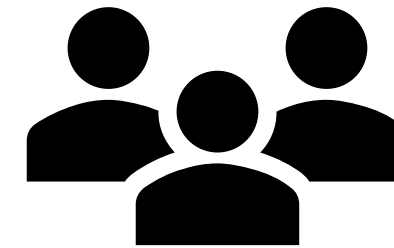
**Investor
& other stakeholders**



**The Real Estate
Investor**



Provides office space



**The tenant and the
employee**



Rents offices space



Uses office space

LITERATURE REVIEW RESULTS



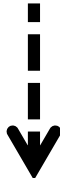
Investor
& other stakeholders

Supply

Value investor



Long term asset value increase

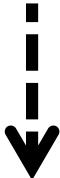


Asset value

Cash-flow investor



Short-term generation of cash flow



Income

Cost reduction

Demand

Tenant



Employee productivity & Branding



Productivity

Branding

Culture

Employee satisfaction

Employee



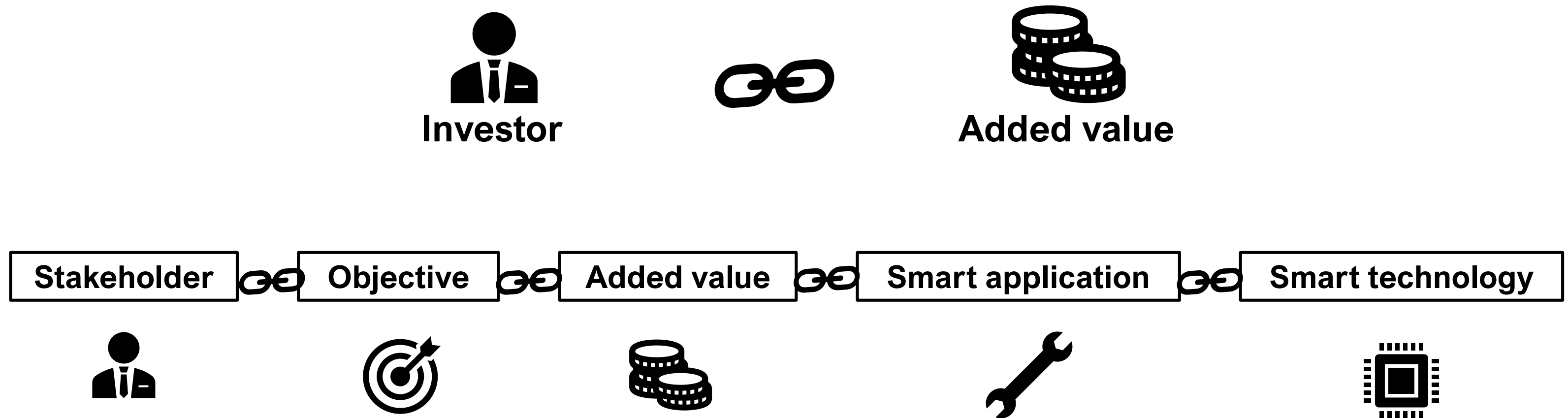
Satisfaction with workplace environment



Satisfaction

THE FIRST PART

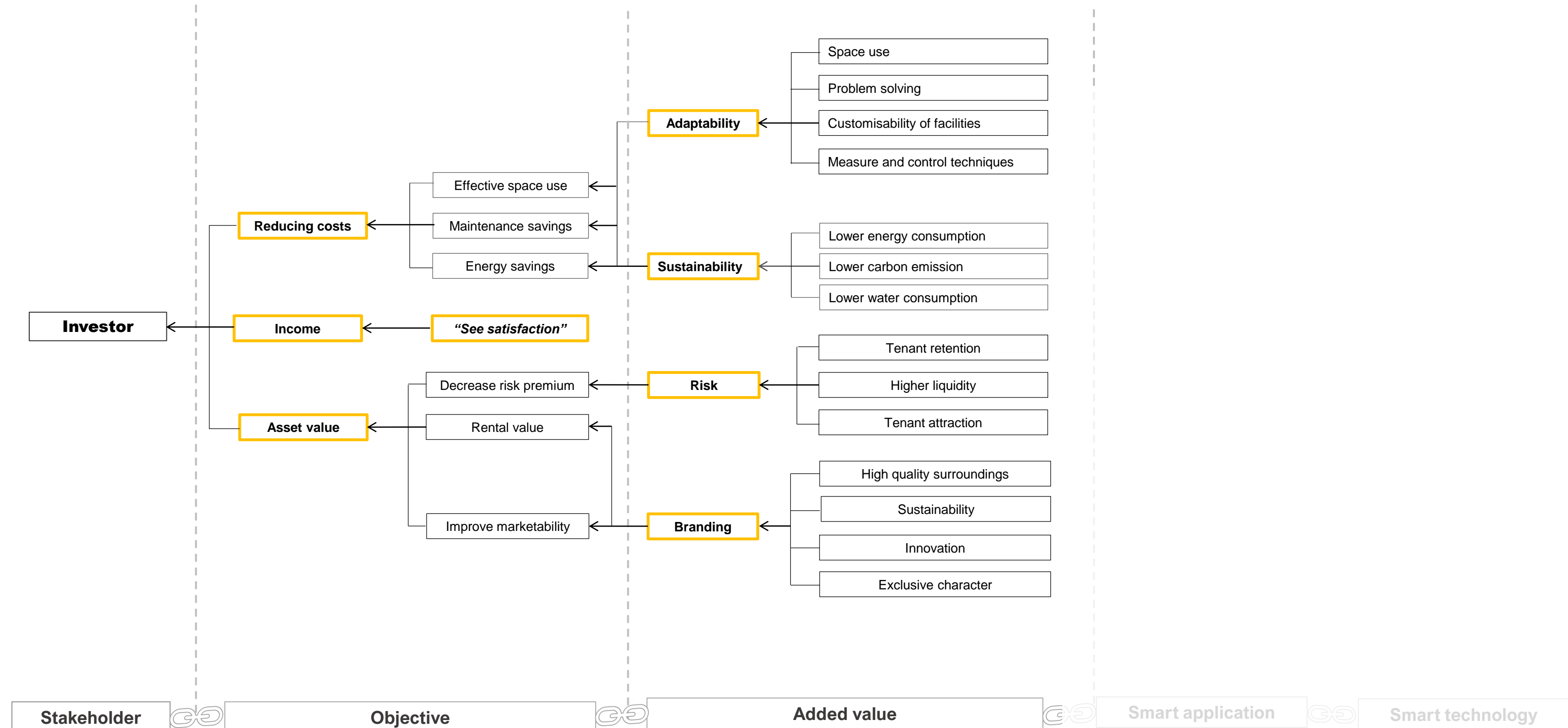
The first part the Smart Value map, connecting added value and the investor can be made.



THE FIRST PART



THE FIRST PART

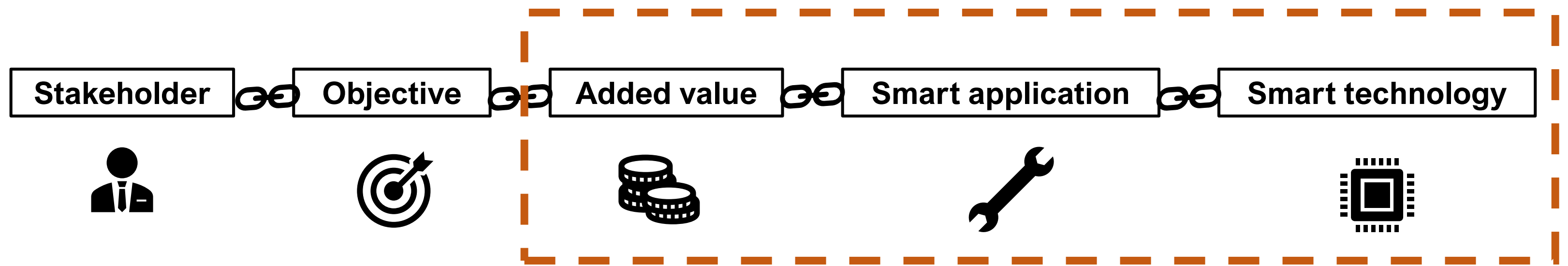


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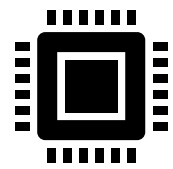
THE SECOND PART



CASE STUDIES



Types of smart applications used in the case.



How the smart applications work



The results of implementing smart technology



Case X



Interview for Case X

- Guiding question 1
- Guiding question 2
- Guiding question 3
- Guiding question 4



12 interviews with:

- Users
- Managers
- Investors

The Edge



The Outlook



The Edge Olympic



6/28/2019

45



Case Study: The Edge Olympic

“The first iteration of the second generation of smart offices”

Key facts

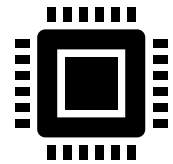
Location:	Amsterdam
Size:	Approximately 12.500 m ² office space
Completed in:	2018
Development type:	Redevelopment
Certifications:	Energy label A, BREAAAM Excellent, WELL Platinum, Cradle2Cradle



CASE STUDIES



Types of smart applications used in the case.

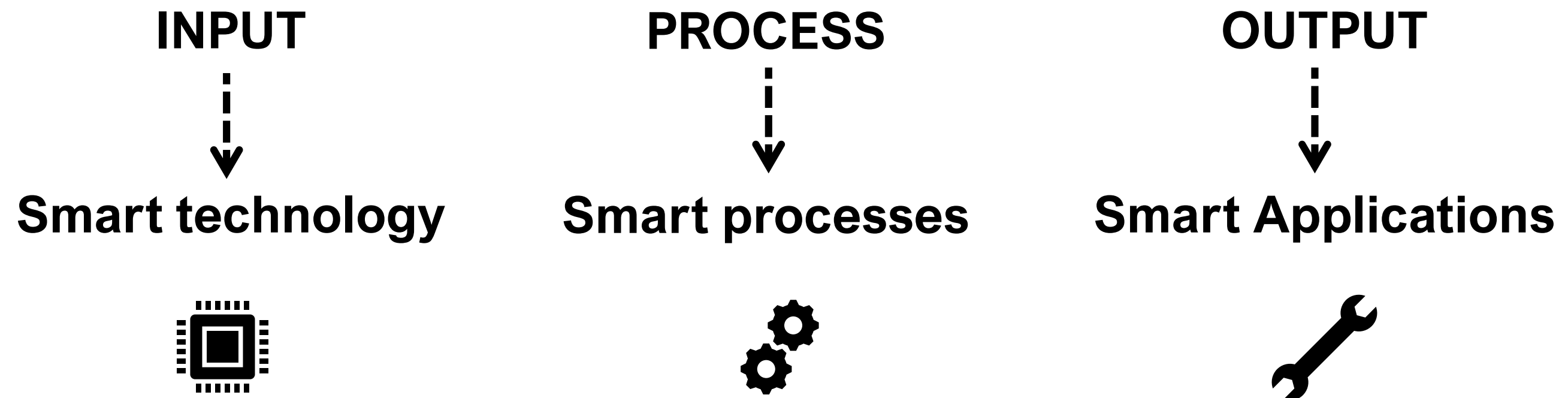


How the smart applications work

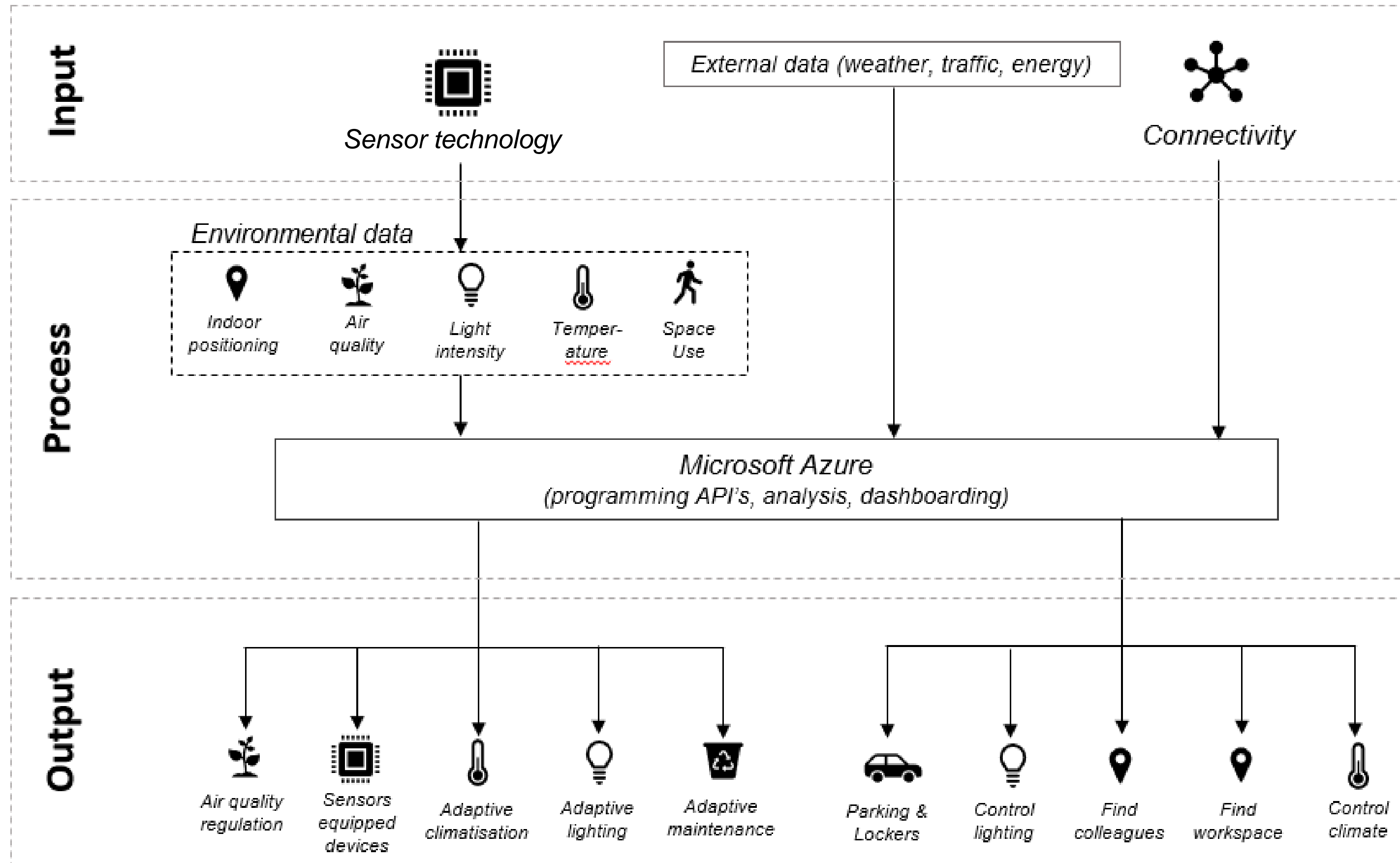


The results of implementing smart technology

CASE SET UP



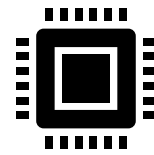
SMART CONCEPT



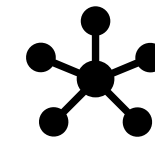
SMART APPLICATIONS

What makes it “smart” compared to other offices

Key words were: interactive and **autonomous**



Sensors



Connectivity



*Air quality
regulation*



*Adaptive
lighting*



*Adaptive
climatisation*

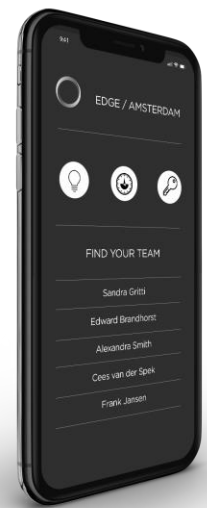


*Adaptive
maintenance*

SMART APPLICATIONS

What makes it “smart” compared to other offices

Key words were: **interactive** and autonomous



Enabled through phone application



Parking & Lockers



Control lighting



Find colleagues




Find workspace



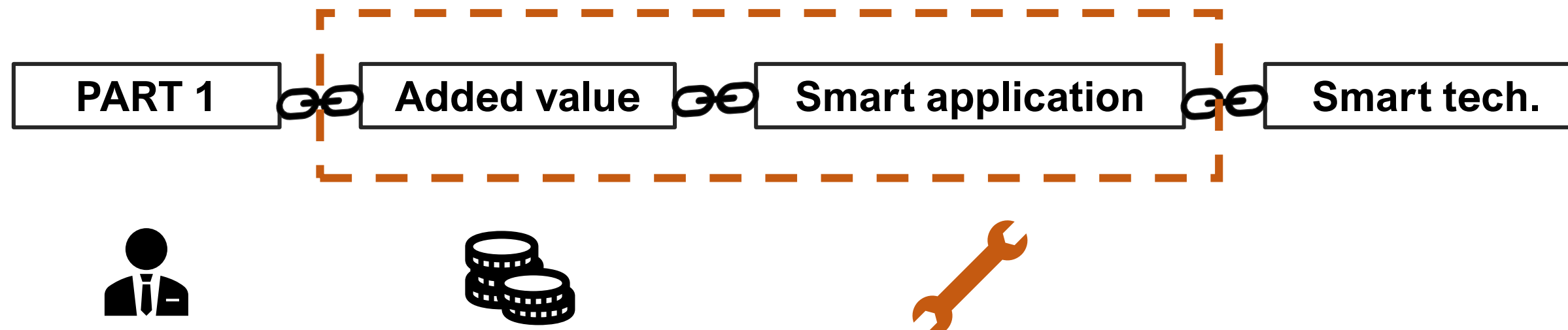
Control climate

ALL THREE CASES

The Edge	The Outlook	The Edge Olympic		The smart applications
Adaptive climate	Adaptive climate	Adaptive climate		Adaptive climate 3
Air quality regulation	Air quality regulation	Air quality regulation		Air quality regulation 3
Adaptive maintenance		Adaptive maintenance		Adaptive maintenance 2
Adaptive lighting	Adaptive lighting	Adaptive lighting		Adaptive lighting 3
Maintenance notifs.		Maintenance notifs.		Maintenance notifs. 2
Controll. lighting	Controll. lighting	Controll. lighting		Controll. lighting 3
Controll. climate	Controll. climate	Controll. climate		Controll. climate 3
Find colleagues	Find colleagues	Find colleagues		Find colleagues 3
Find workspace	Find workspace	Find workspace		Find workspace 3
Book rooms & lockers		Book rooms & lockers		Book rooms & lockers 2
Smart office concept	Smart office concept	Smart office concept		Smart office concept 3

SMART APPLICATIONS

How can the applications contribute to the added values?

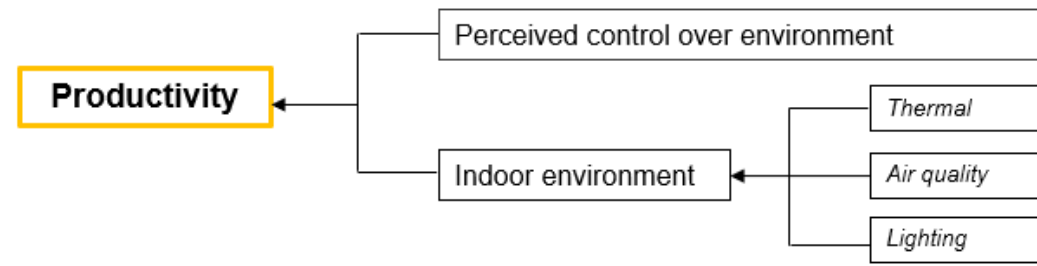


SMART APPLICATIONS

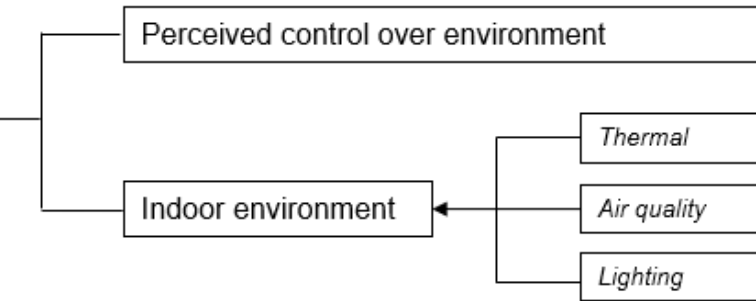
How can the applications contribute to the added values?



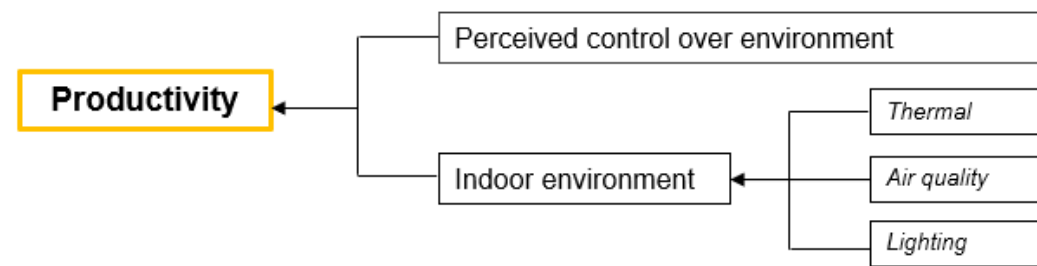
Control climate



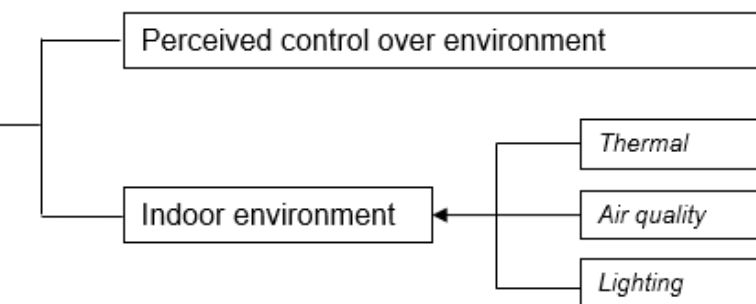
Satisfaction



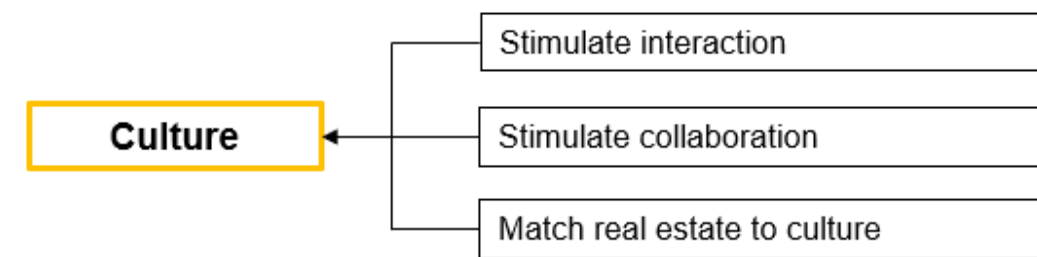
Control lighting



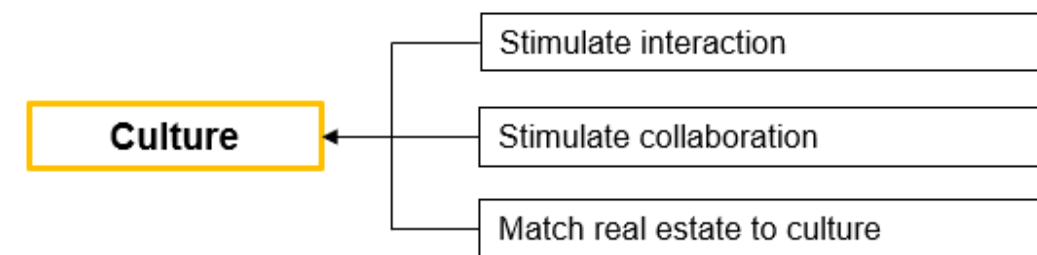
Satisfaction



Find colleagues

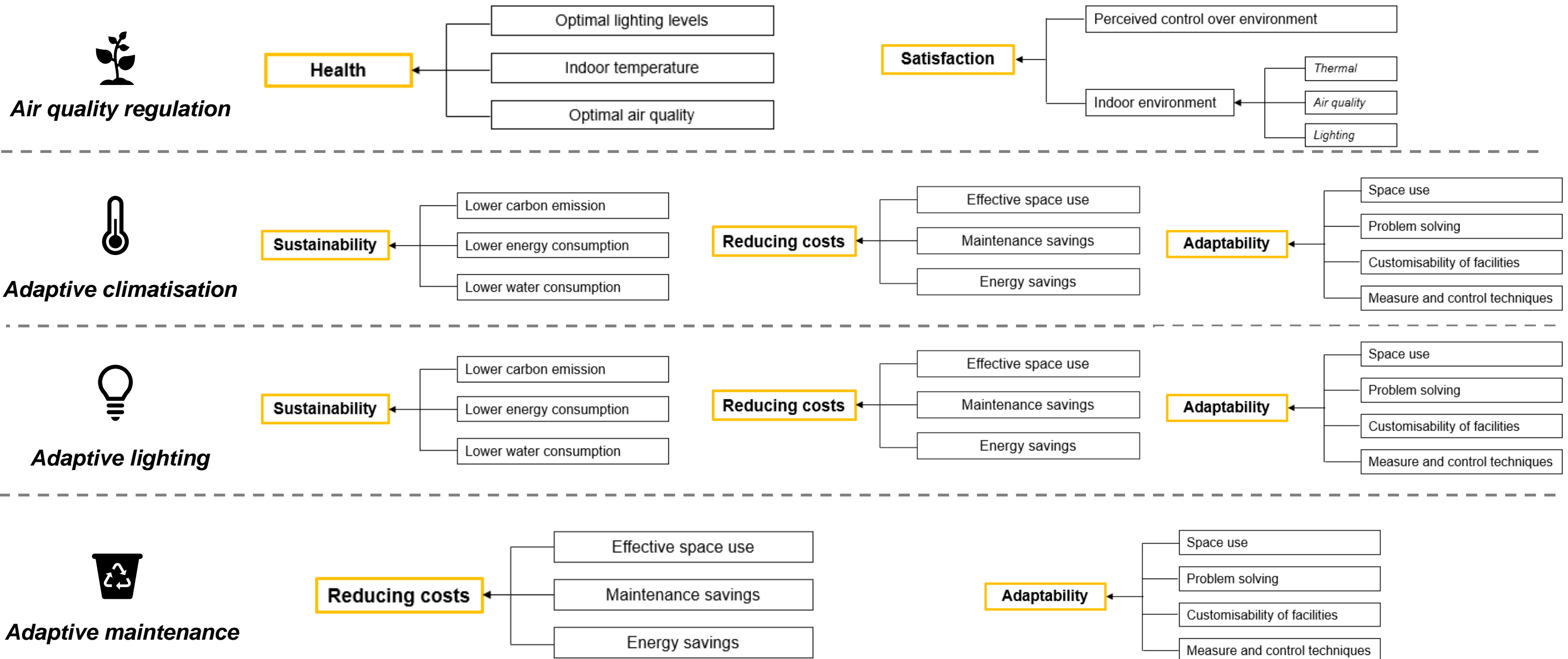


Find workspace



SMART APPLICATIONS

How can the applications contribute to the added values?

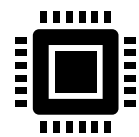


SMART APPLICATIONS

How can the applications contribute to the added values?



Air quality regulation



Sensors equipped devices



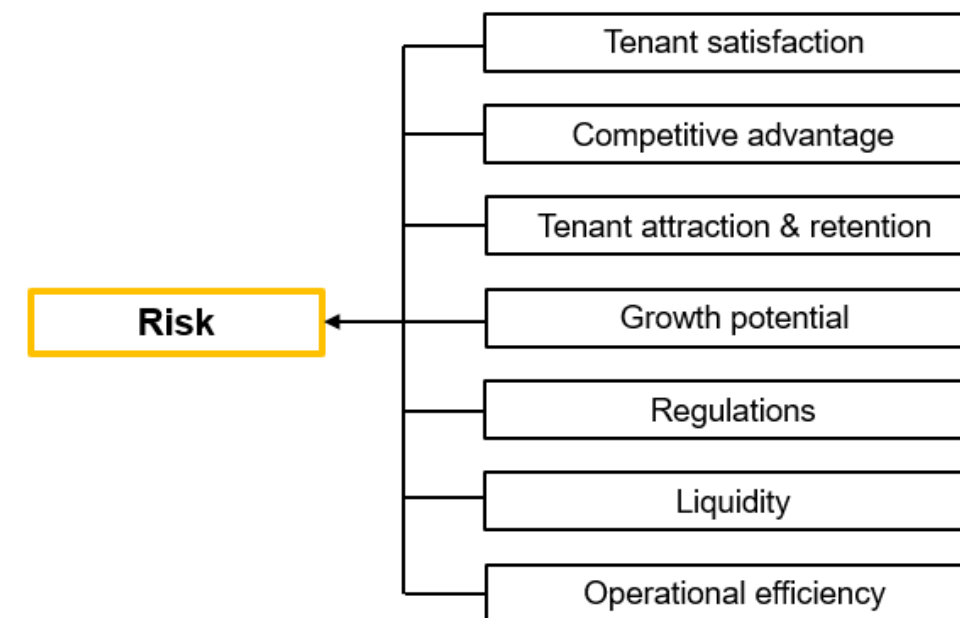
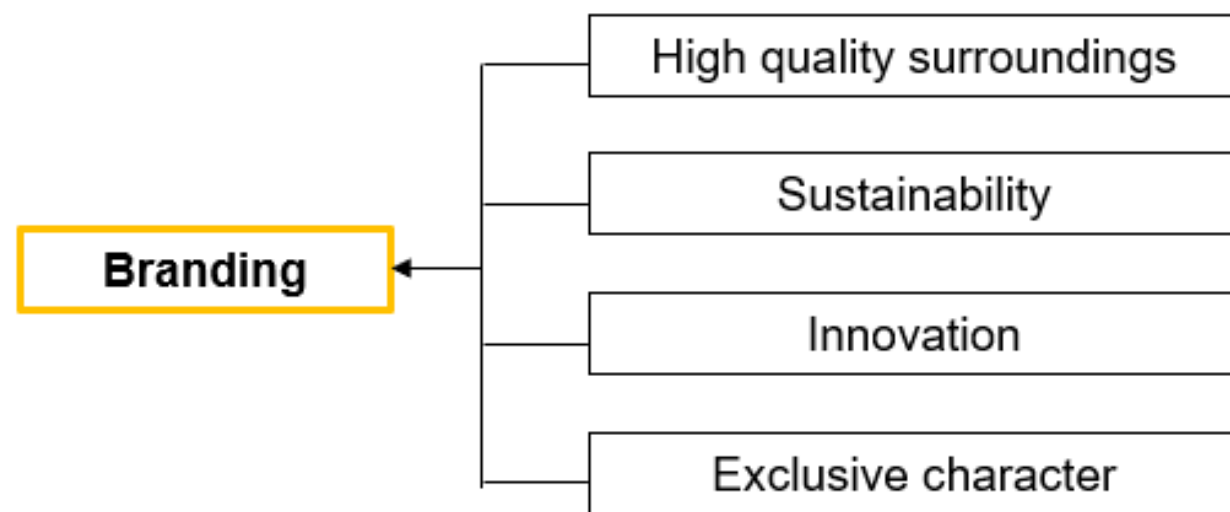
Adaptive climatisation



Adaptive lighting



Adaptive maintenance



Parking & Lockers



Control lighting



Find colleagues



Find workspace



Control climate

CROSS CASE

 Strategic
  Physical
  Functional
  Financial

The Edge

Sustainability
Health
User Satisfaction
Productivity
Culture
Tenant satisfaction
Innovation
Branding
Risk reduction
Cost reduction
Adaptability

The Outlook

Sustainability
Health
User Satisfaction
Productivity
Culture
Tenant satisfaction
Innovation
Branding
Risk reduction
Cost reduction
Adaptability

Edge Olympic

Sustainability
Health
User Satisfaction
Productivity
Tenant satisfaction
Innovation
Branding
Risk reduction
Cost reduction
Adaptability
Asset Value
Income



Added values

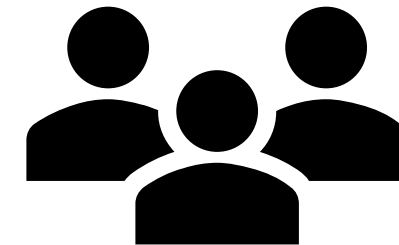
Sustainability	3
Health	3
User Satisfaction	3
Productivity	3
Culture	2
Tenant satisfaction	3
Innovation	3
Branding	3
Risk reduction	3
Cost reduction	3
Adaptability	3
Asset Value	1
Income	1

CROSS CASE

“We want a smart office to support our culture and increase our branding”



**The Real Estate
Investor**



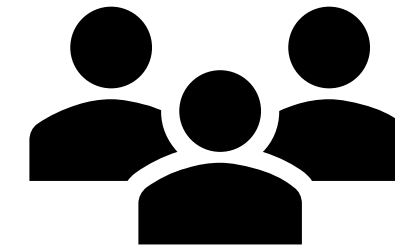
The tenant

CROSS CASE

“I will do it to keep you as a tenant”



**The Real Estate
Investor**



The tenant

Tenant satisfaction

METHODOLOGY

Method	Literature review	Case studies	Interviews	Expert panel
Aim	Create a theoretical base on the reserach topics	Study real life examples and enrich the theory and draw conclusions.	Gather inisghts for the case studies throught involved stakeholders	Find consensus on importance of different values and smart applications
Results	Theoretical framework combining research topics	List of used smart applications and drivers of smart buildings.	Specific information on the different case studies and drivers for smart buildings.	Consensus on what values and smart applications are most useful and important

Image 10. Method overview. Own illustration. Icons by PowerPoint.

EXPERT PANEL

*Rank the added values from **most important to least important***

Ranking round 1	(Geomean)	Ranking round 2	(Geomean)
Satisfaction	7,1	Satisfaction	7,3
Sustainability	7,0	Sustainability	6,9
Health	5,7	Productivity	6,7
Productivity	4,8	Health	5,9
Adaptability	4,8	Adaptability	4,0
Branding	4,7	Branding	3,9
Risk	4,2	Culture	3,8
Culture	2,8	Risk	2,8

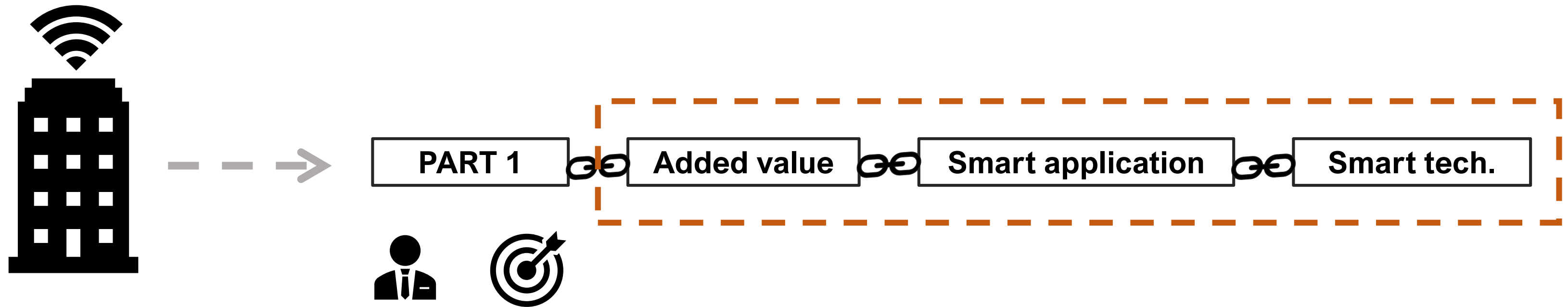
Figure 96a. Comparison between the ranking of round 1 and round 2 using an average scoring.

SATISFACTION

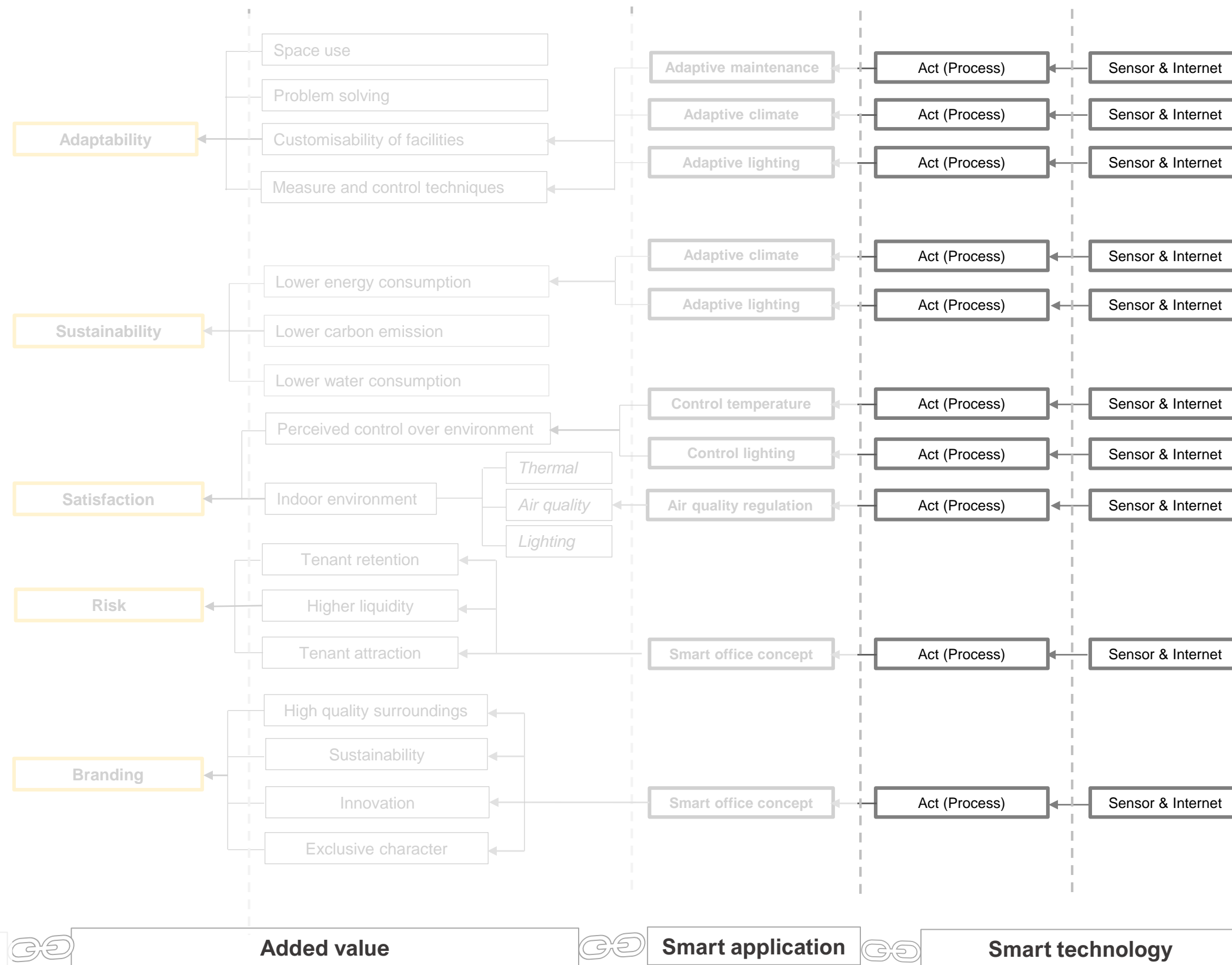
*In line with the **case studies** and the **interviews**, **Satisfaction** is seen as **very important***

Tenant satisfaction

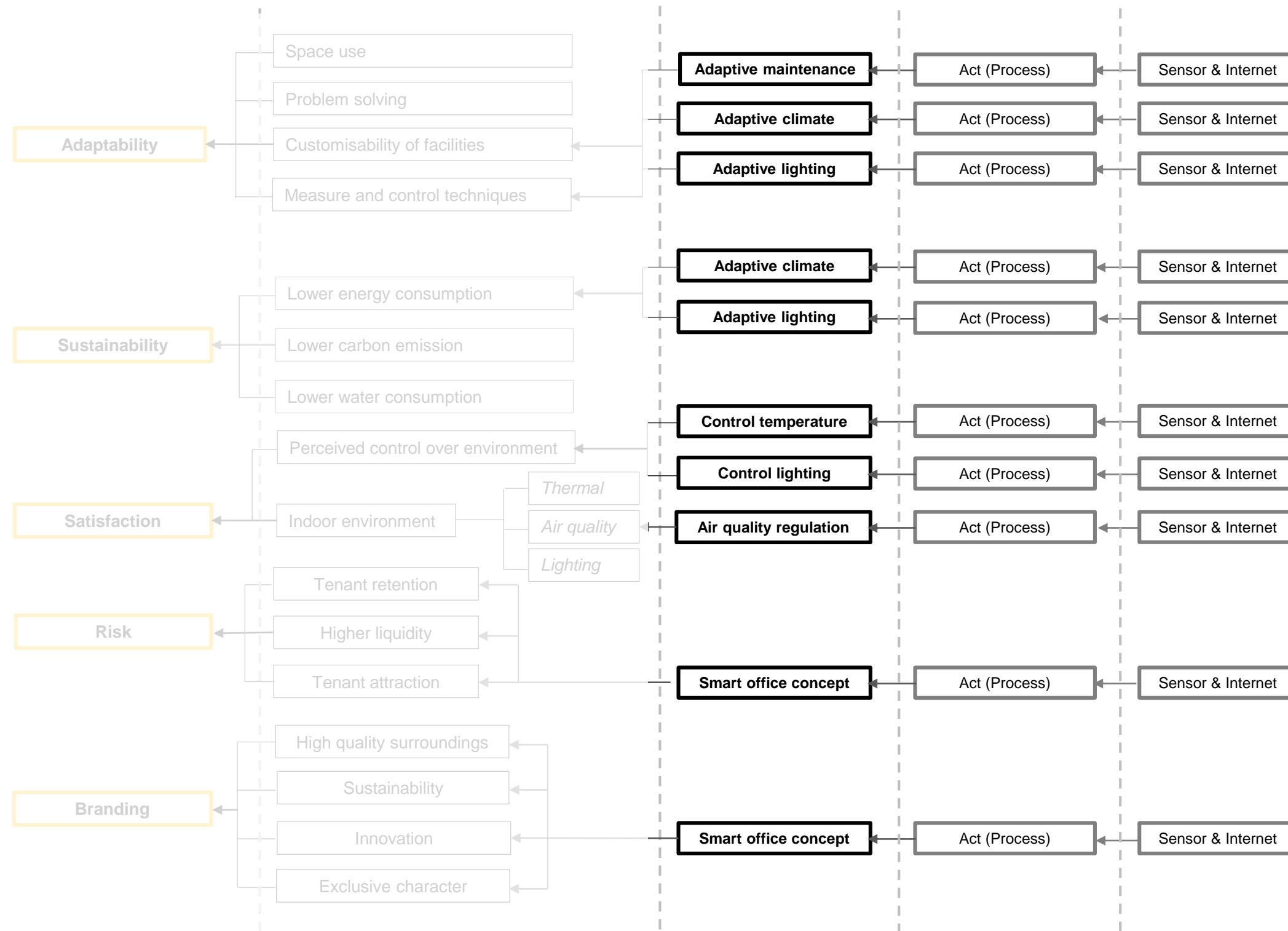
THE SECOND PART



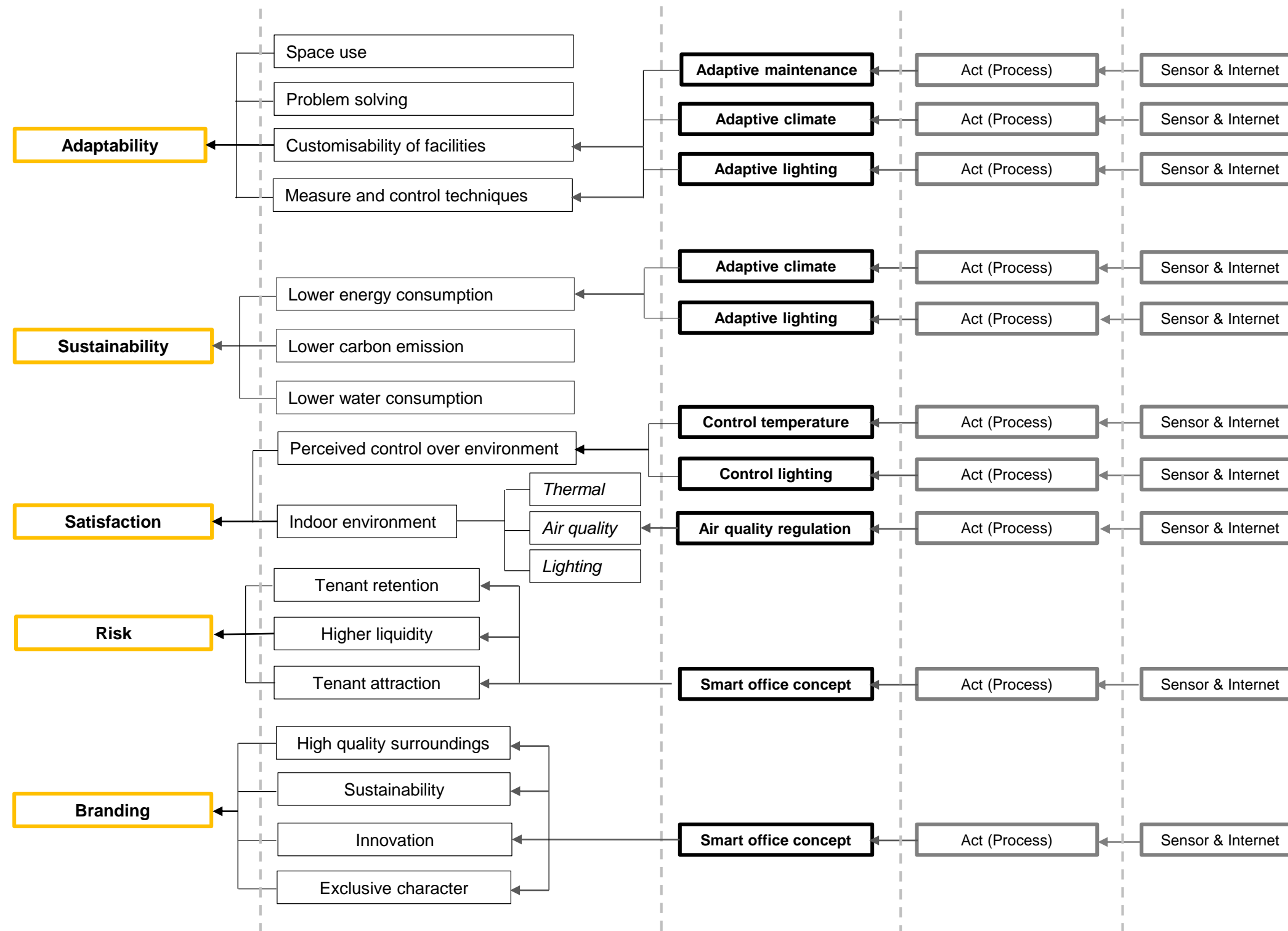
SECOND PART



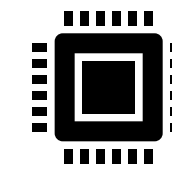
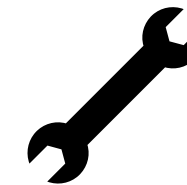
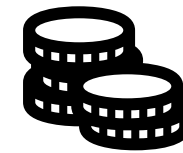
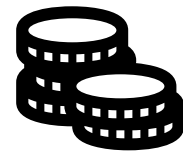
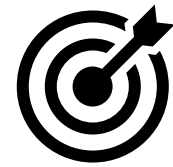
SECOND PART



SECOND PART



SECOND PART



Part 1



Part 2

CONCLUSIONS

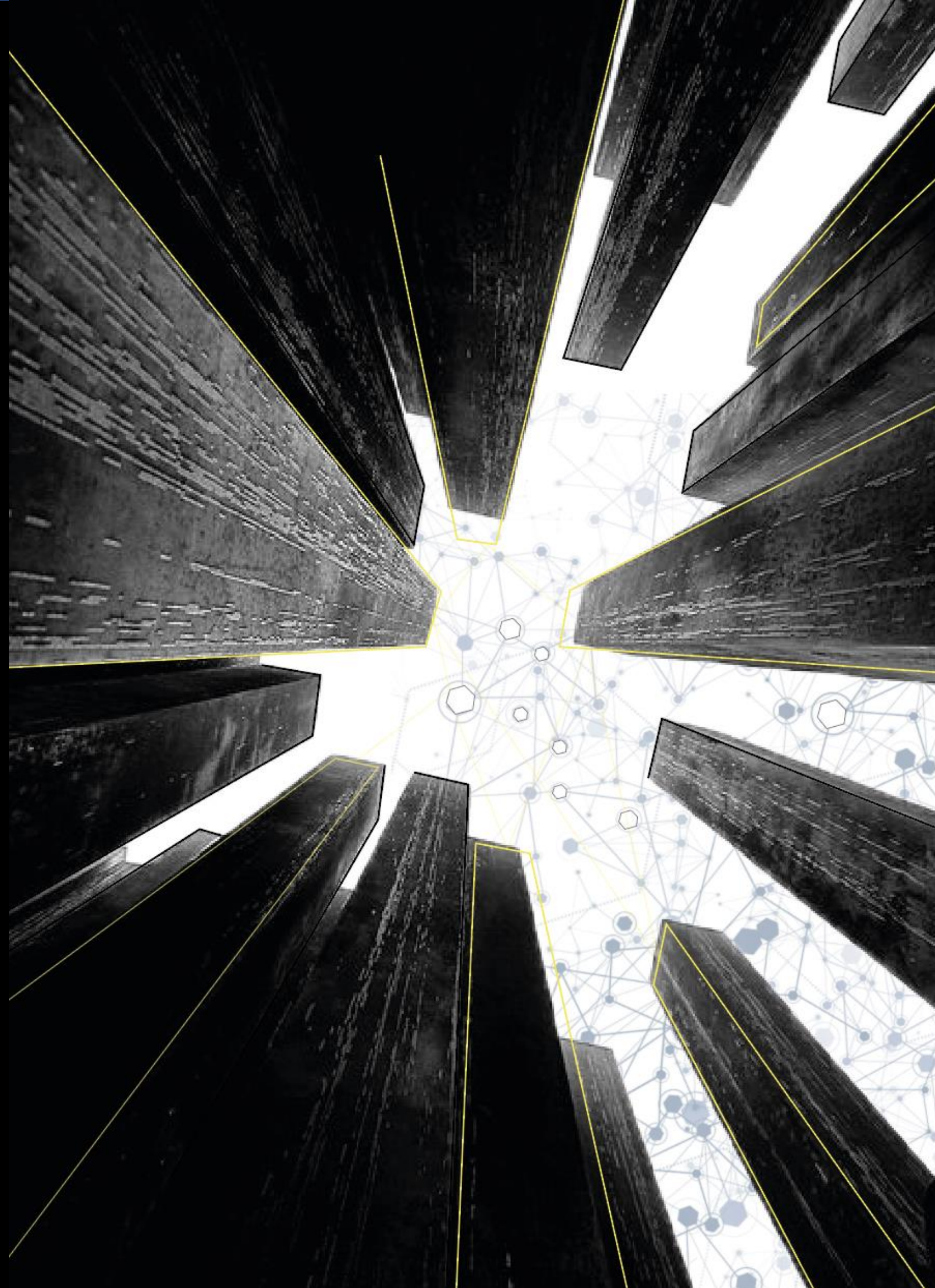
P5 presentation

27 - 06 - 2019

MSc Management in the Built Environment (MBE)

Jeremie Oudot

4287649



CONCLUSIONS

“How can smart technology in office buildings provide added value to real estate investors?”

CONCLUSIONS

1

Tenant satisfaction

Based on interviews, case studies and the expert panel

2

Reducing costs

Income

Asset value

Based on the theory

CONCLUSIONS

1

Tenant satisfaction

Based on interviews, case studies and the expert panel

2

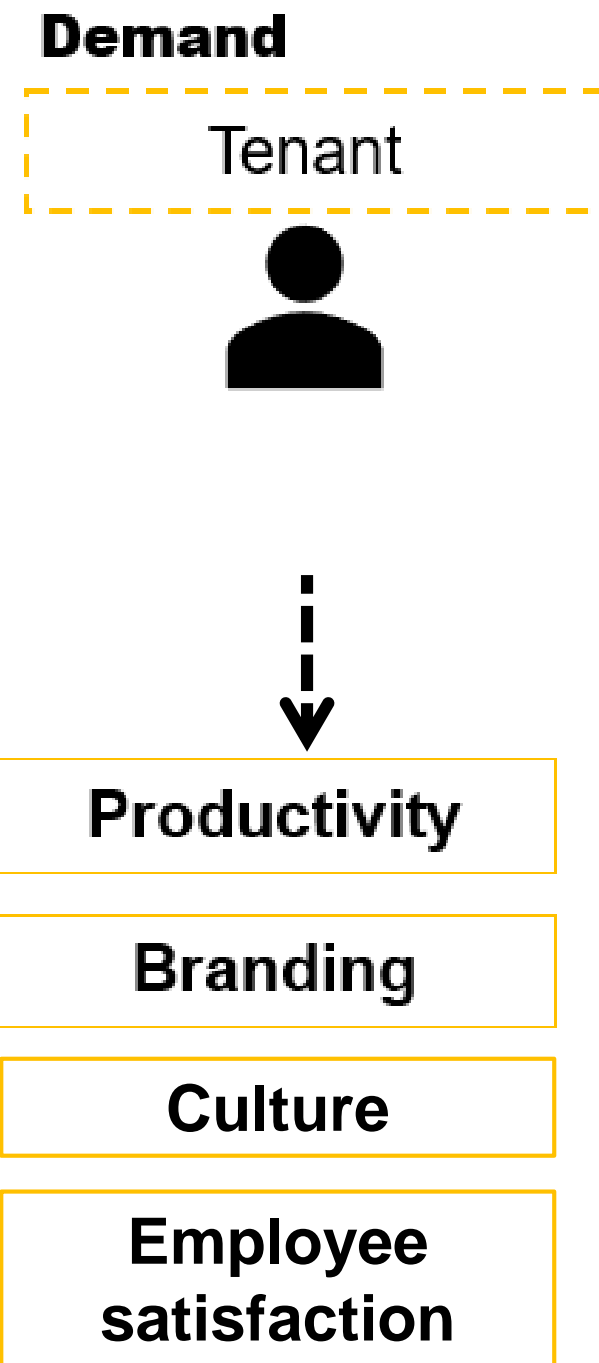
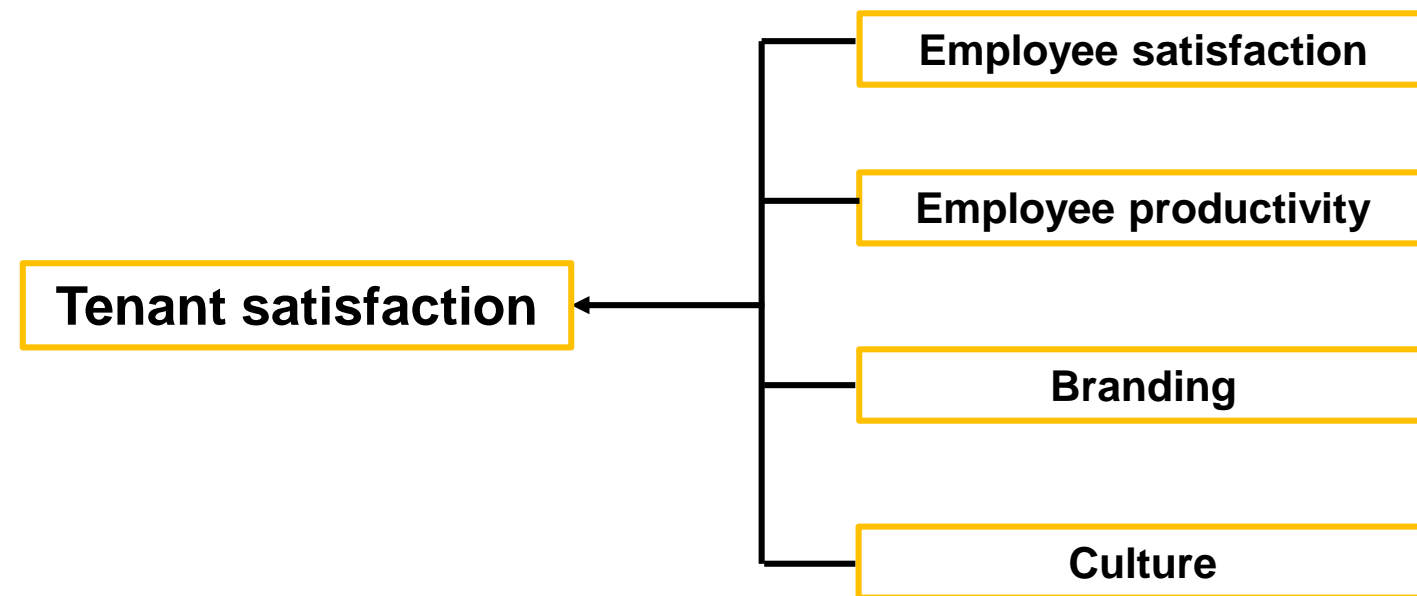
Reducing costs

Income

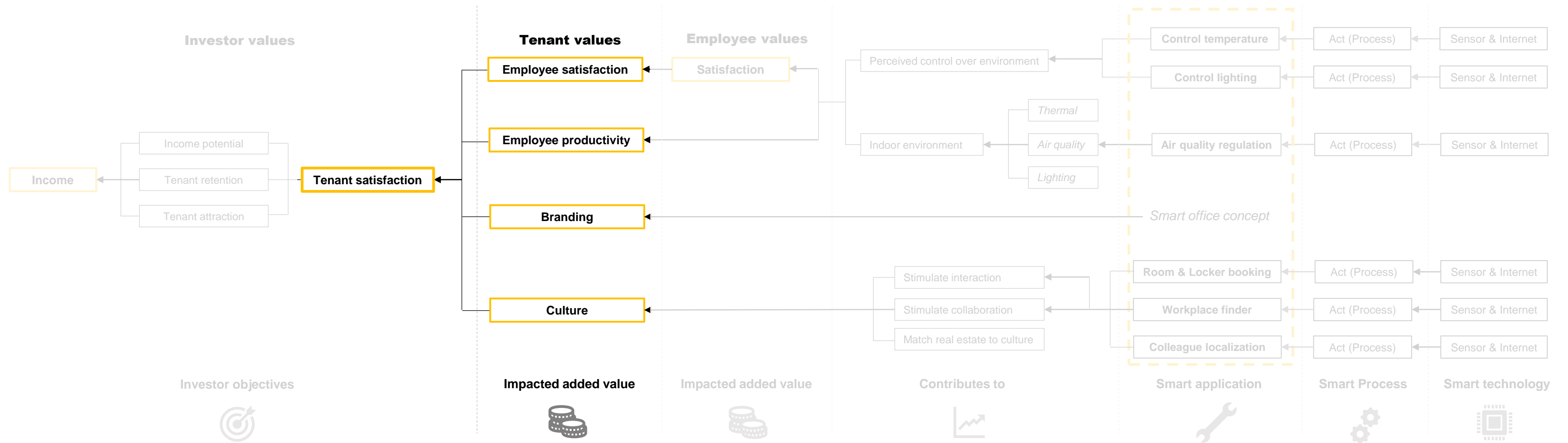
Asset value

Based on the theory

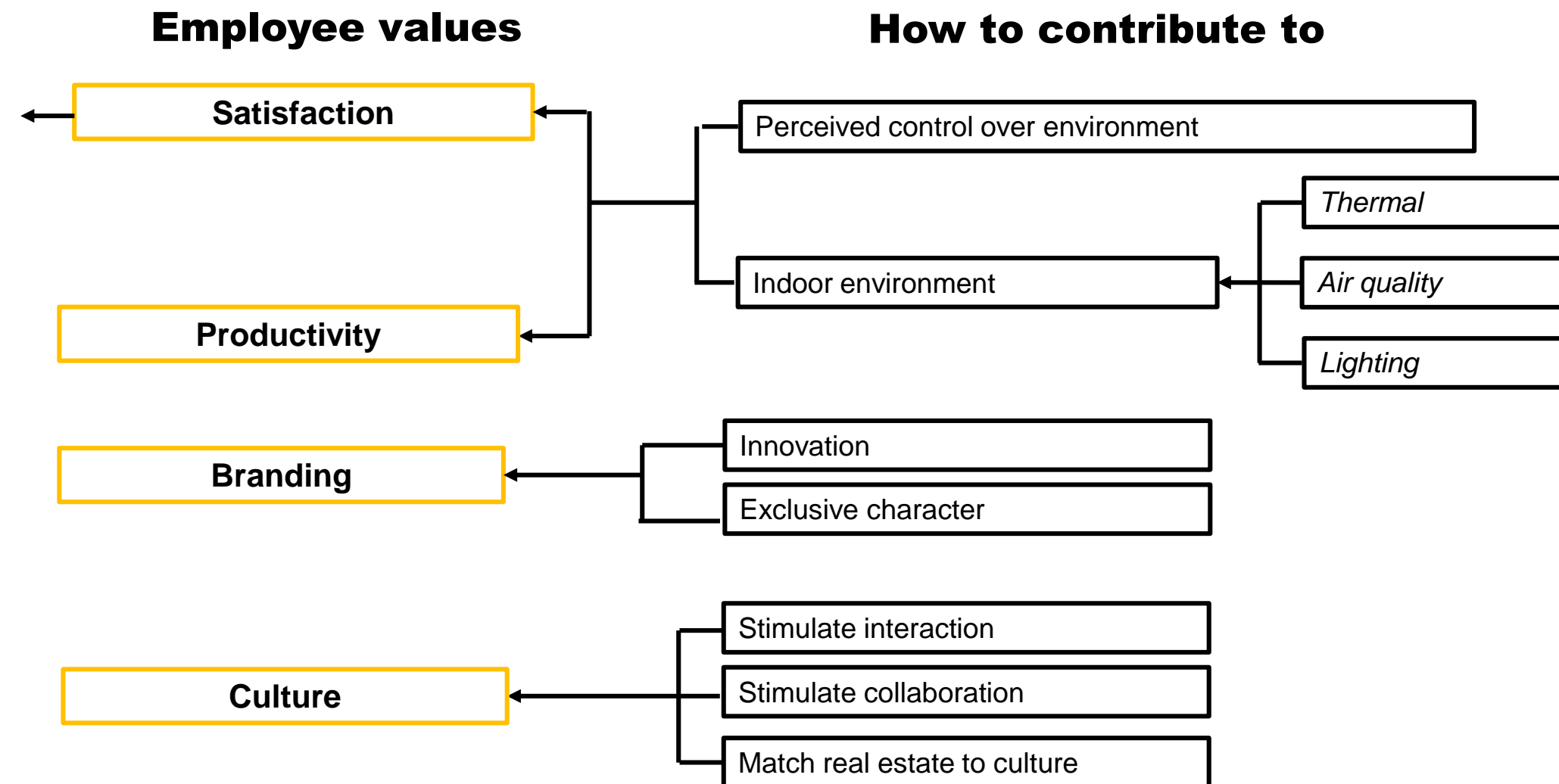
TENANT SATISFACTION



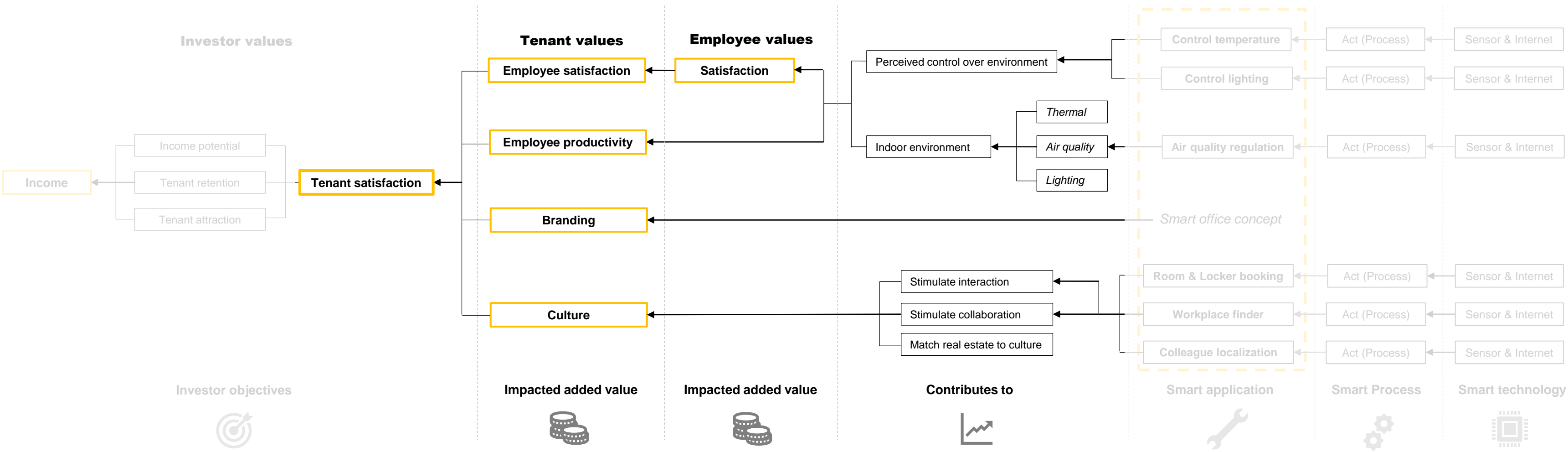
SATISFACTION



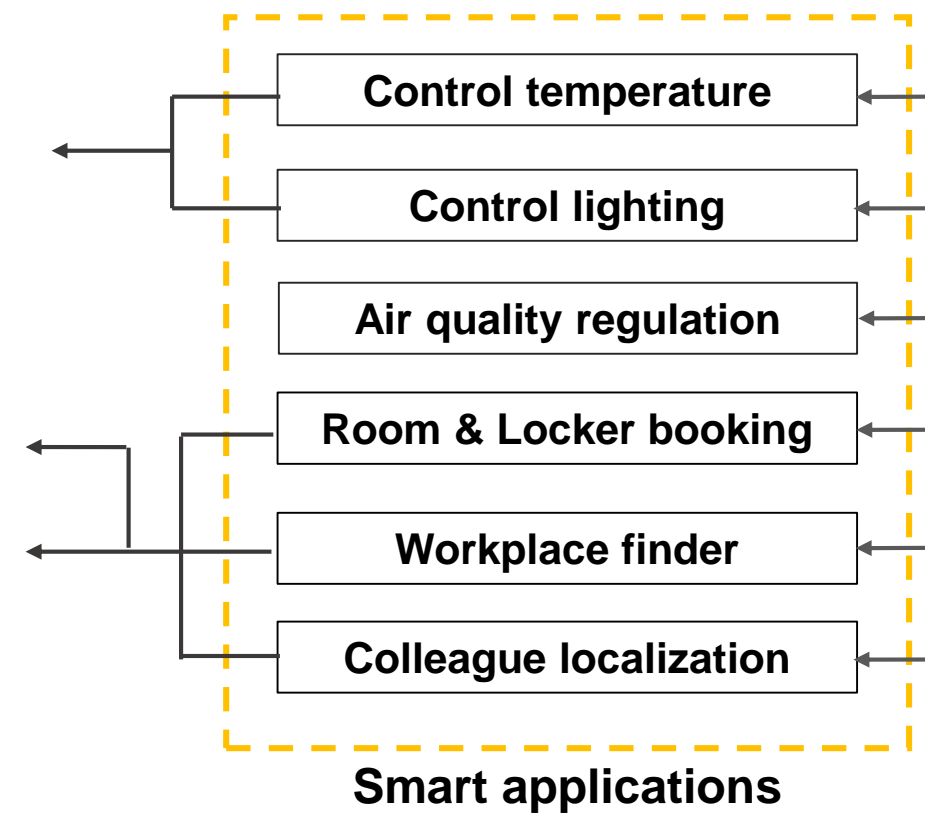
CONTRIBUTE TO



SMART VALUE MAP



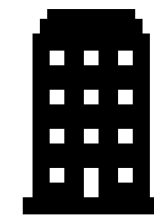
SMART APPLICATIONS



Case 1

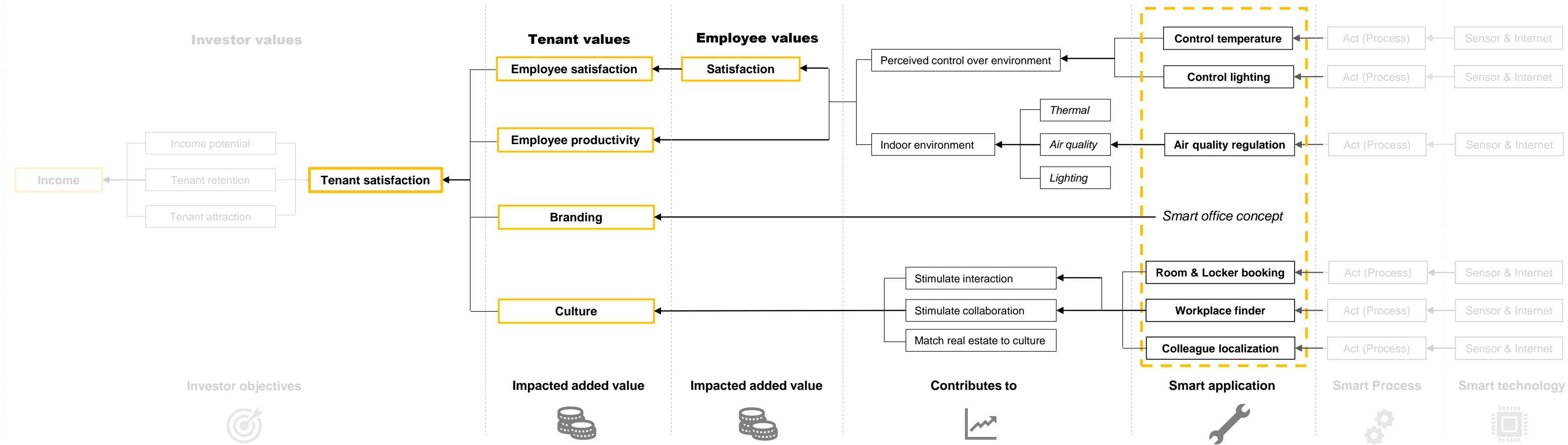


Case 2

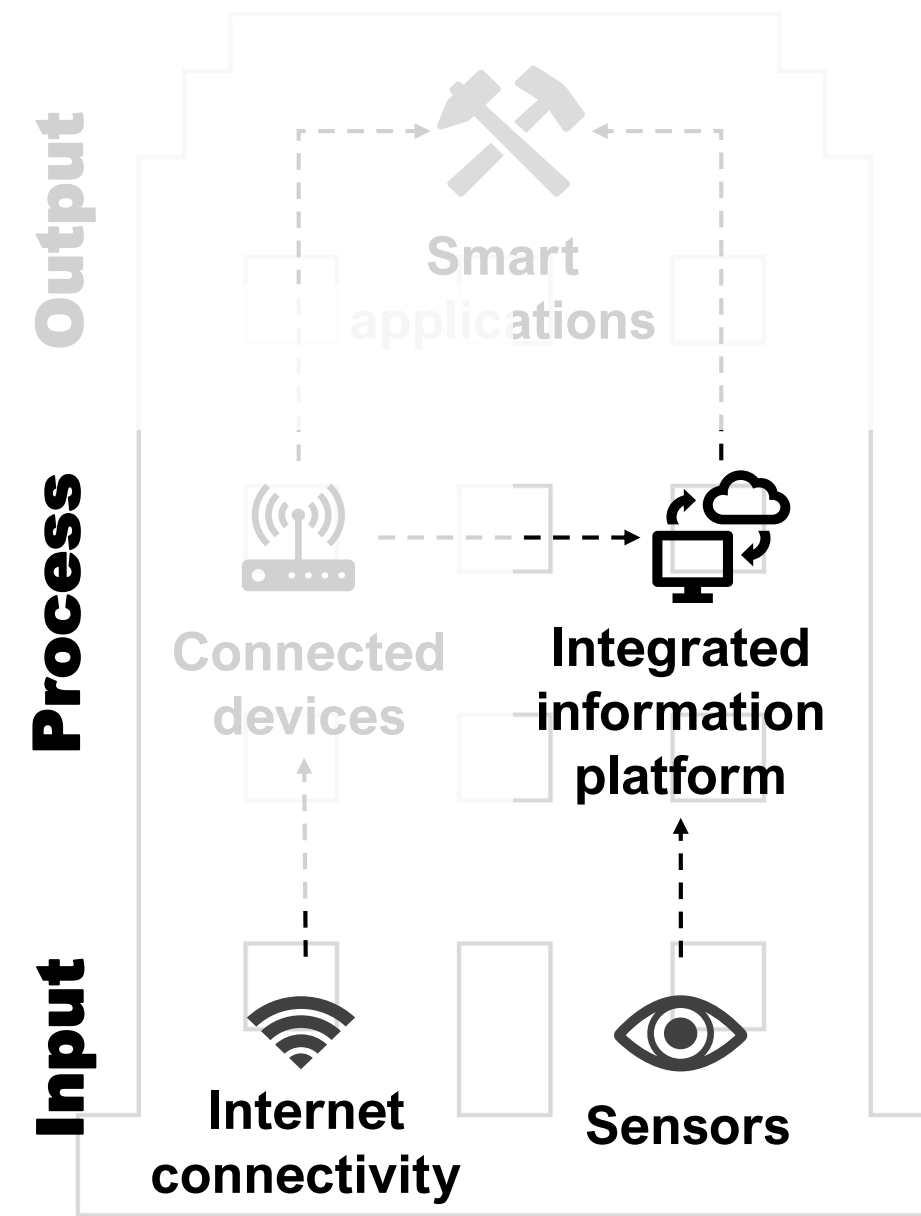
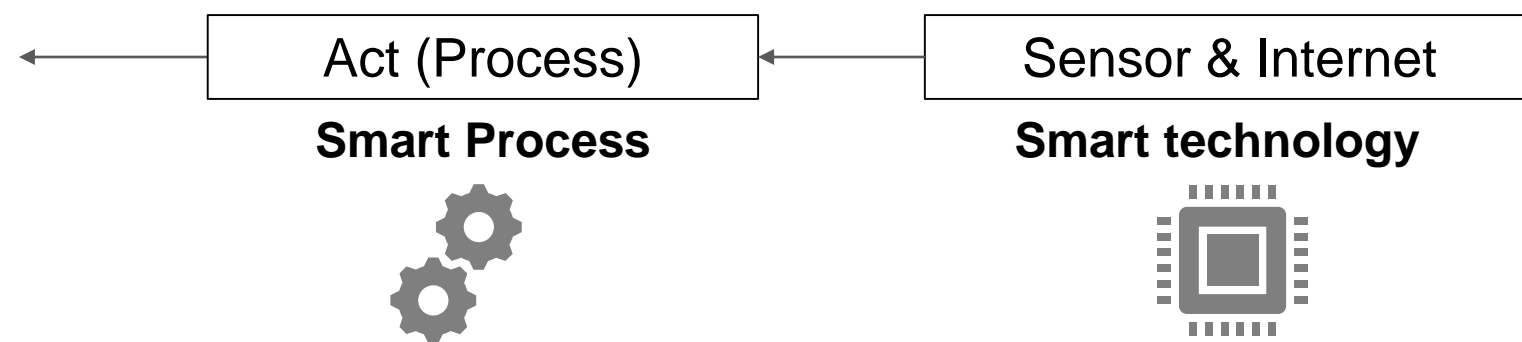


Case 3

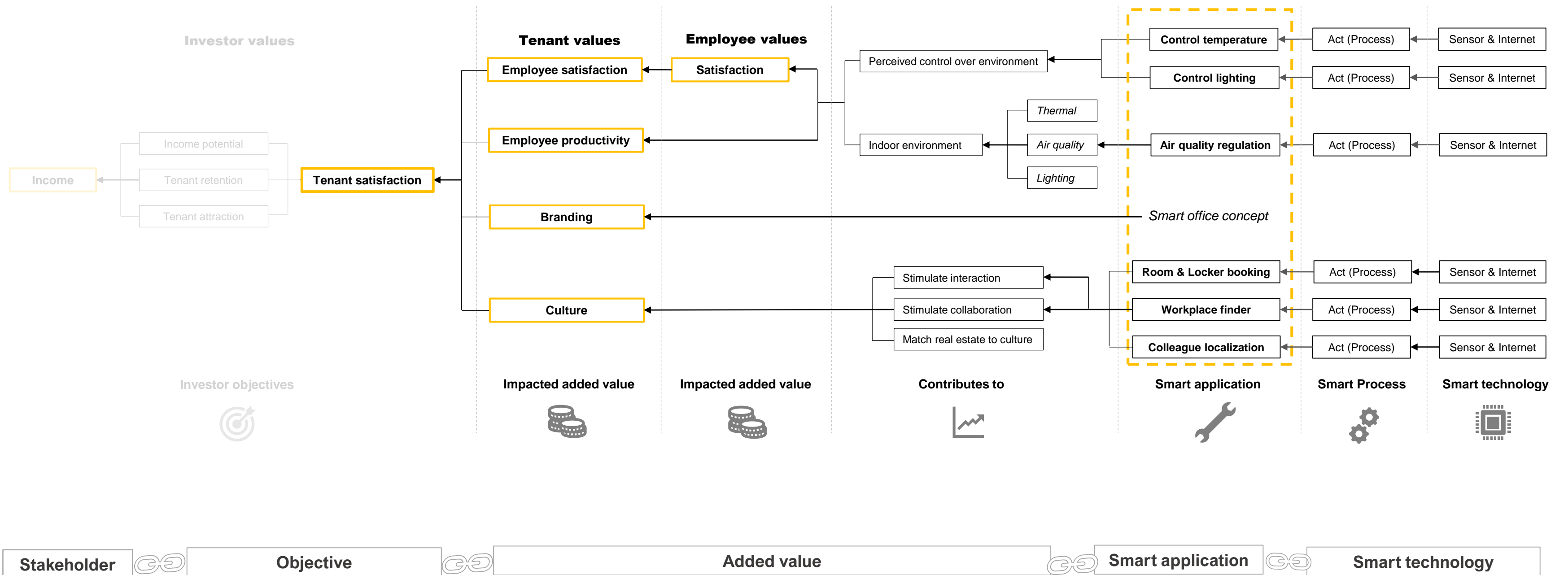
SMART VALUE MAP



SMART TECHNOLOGY



SMART VALUE MAP



Stakeholder

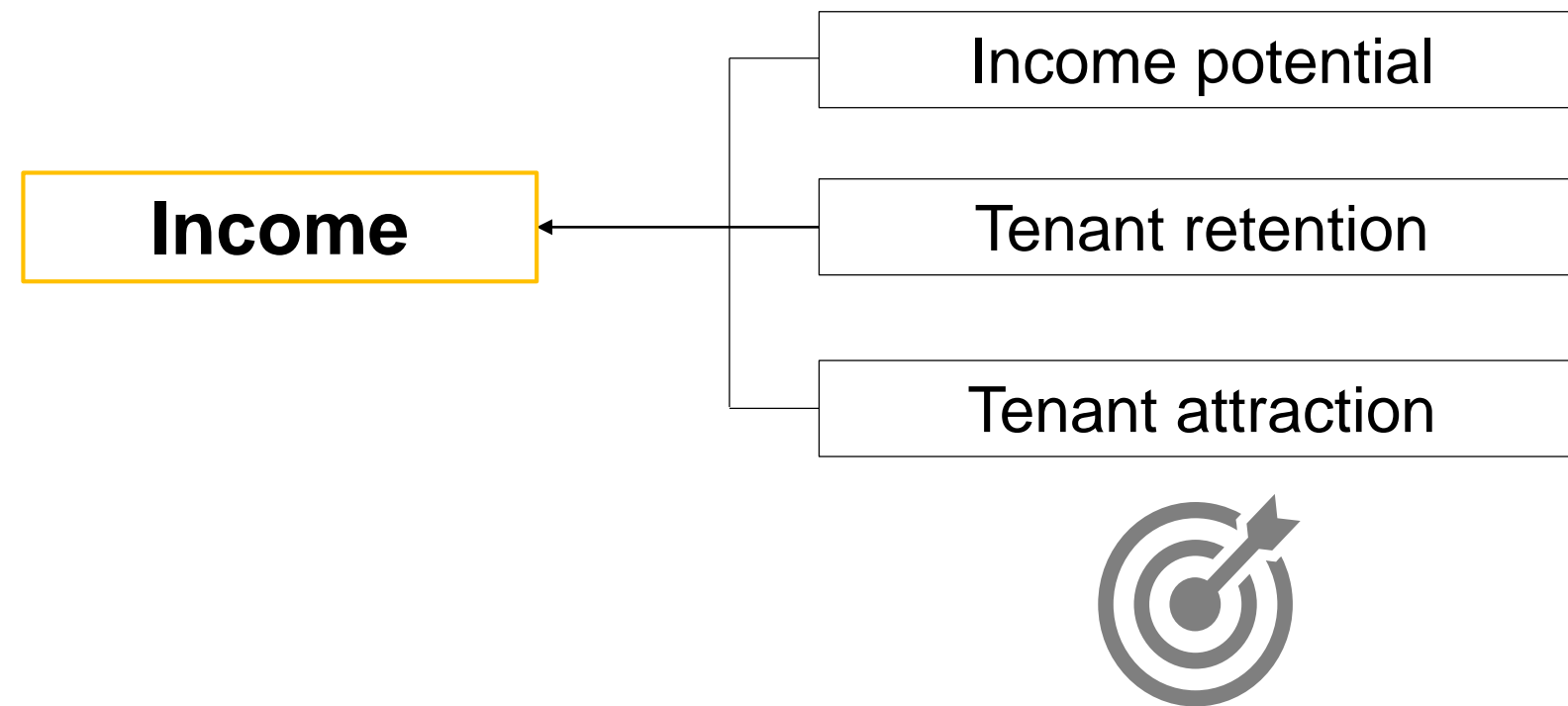
Objective

Added value

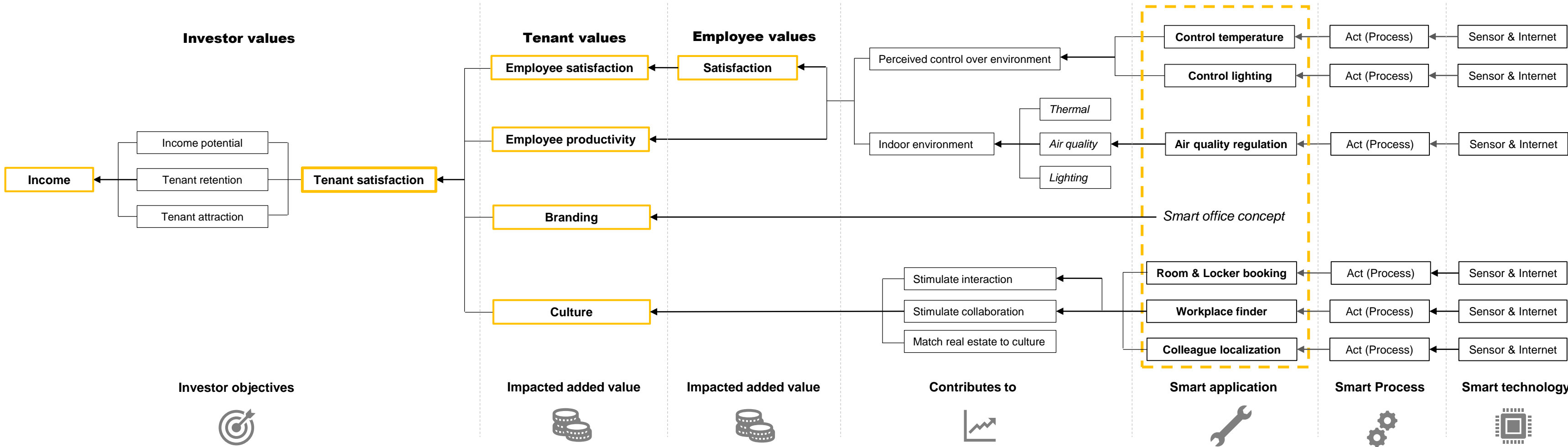
Smart application

Smart technology

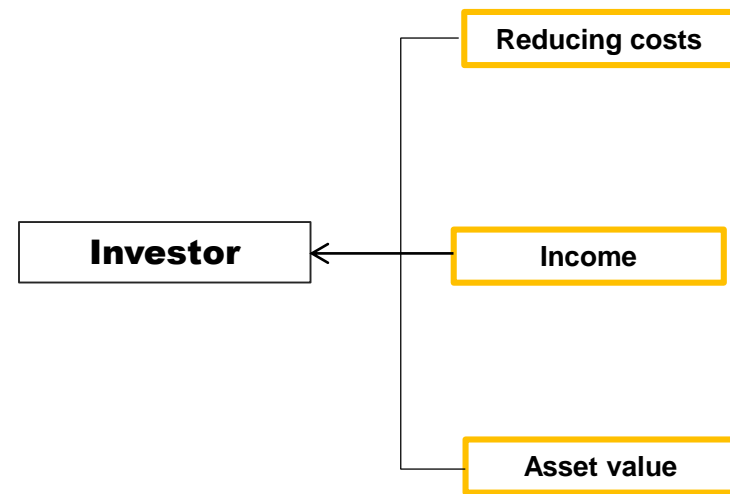
SATISFACTION



SMART VALUE MAP



IN LINE WITH THEORY



*A similar value map can be made to connect **smart technology** with **costs** and **asset value**.*

Investor objectives



Impacted added value



Impacted added value



Contributes to



Smart application



Smart Process



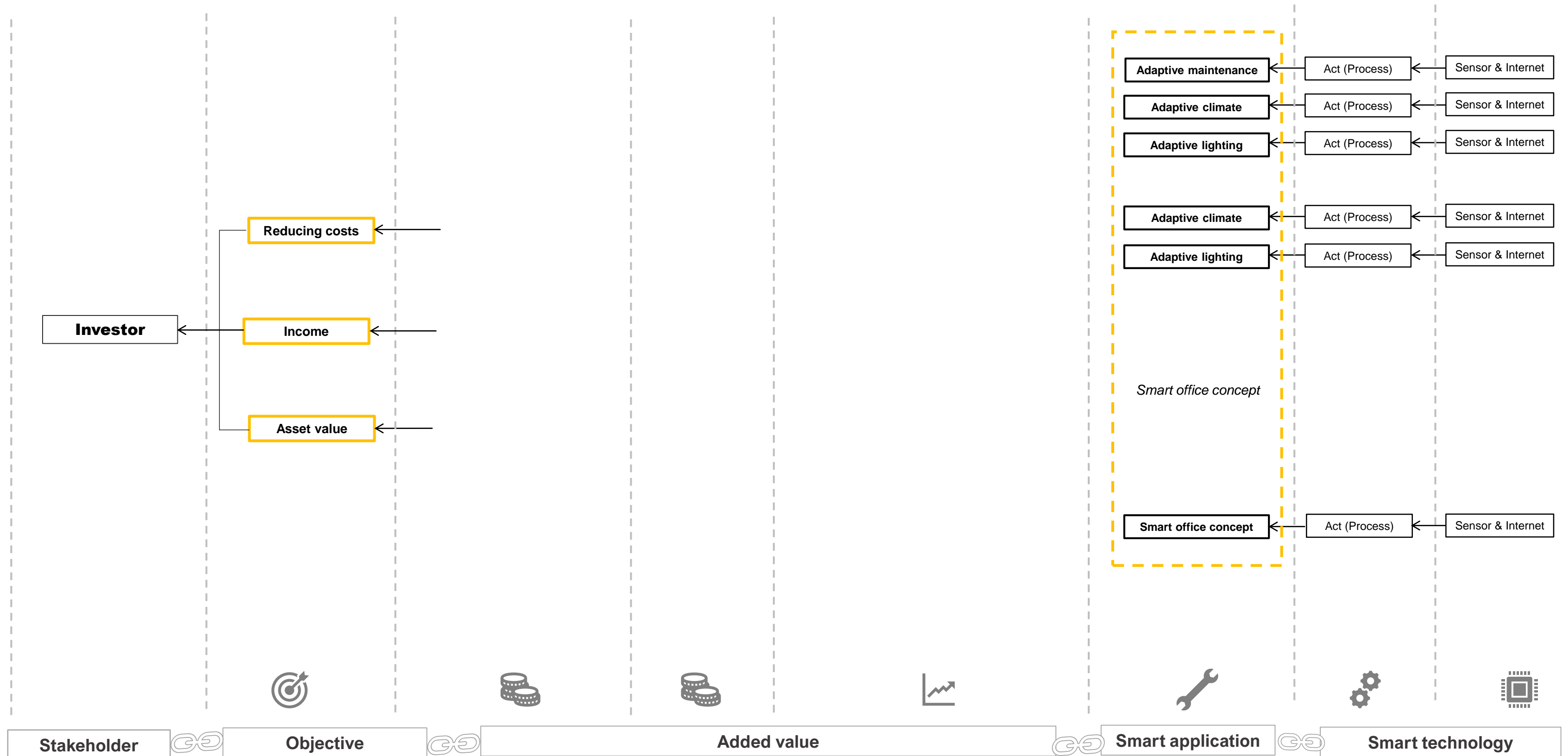
Smart technology



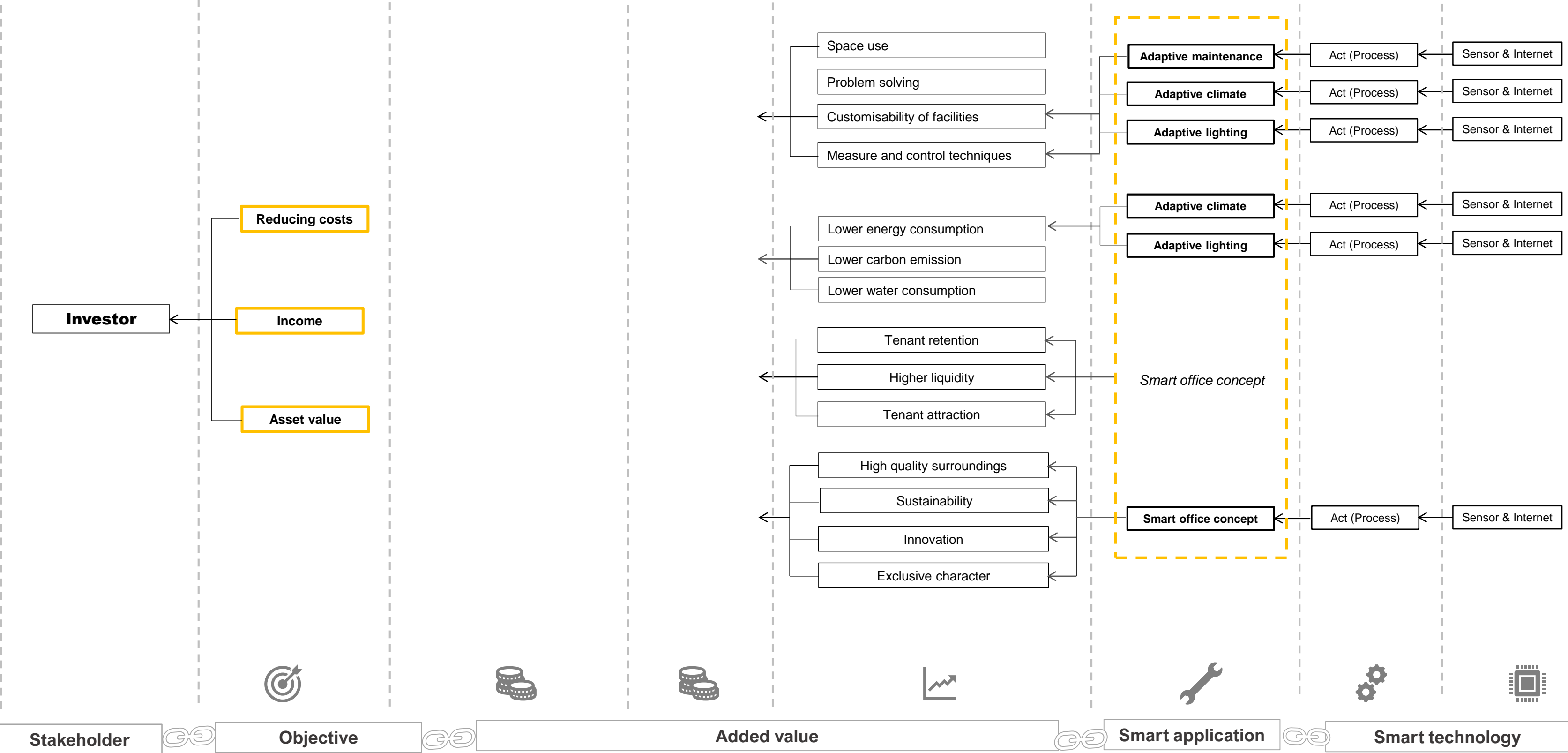
SMART TECHNOLOGY



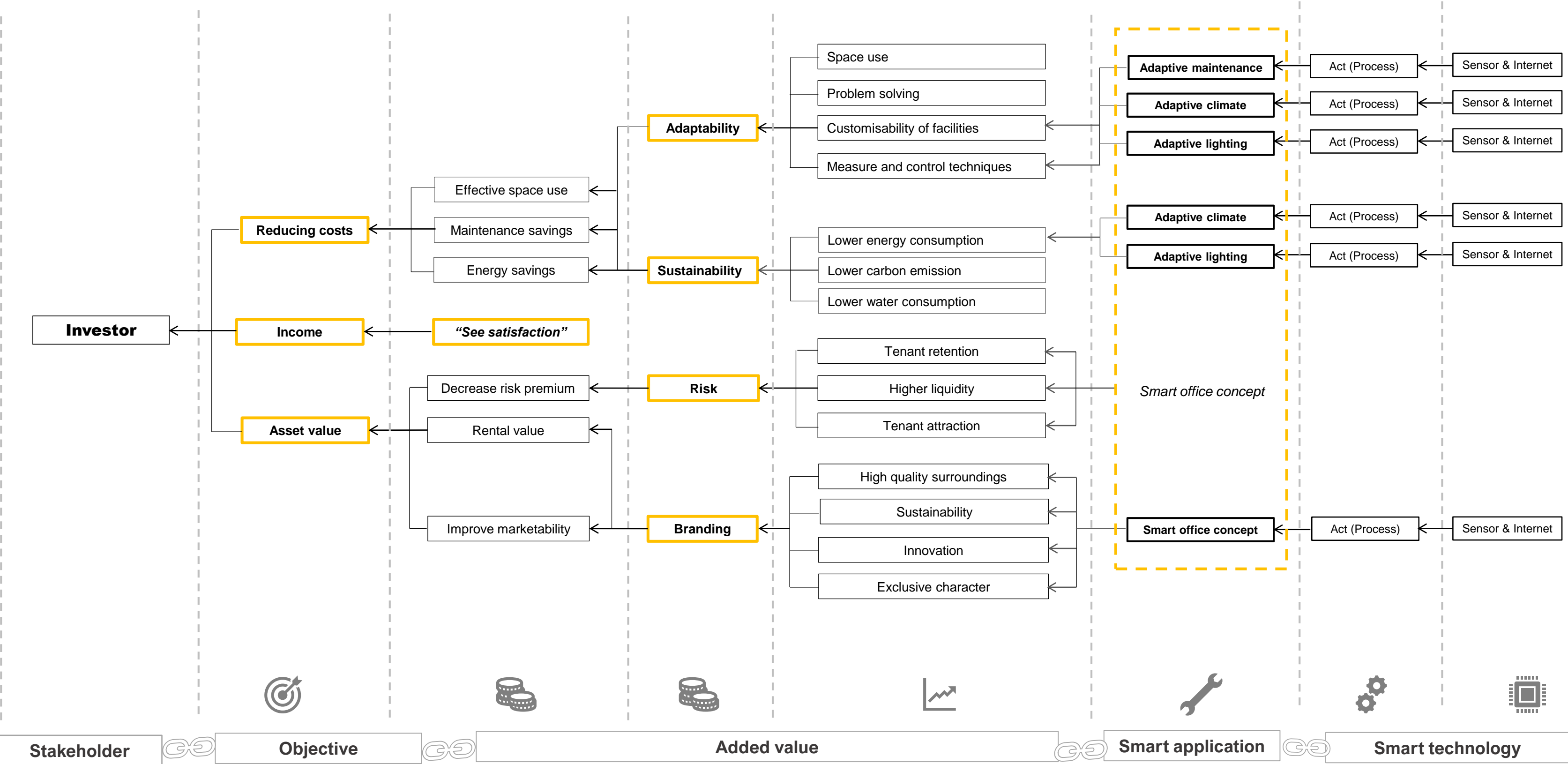
SMART APPLICATIONS



CONTRIBUTE TO



SMART VALUE MAP



ANSWERING THE MAIN QUESTION

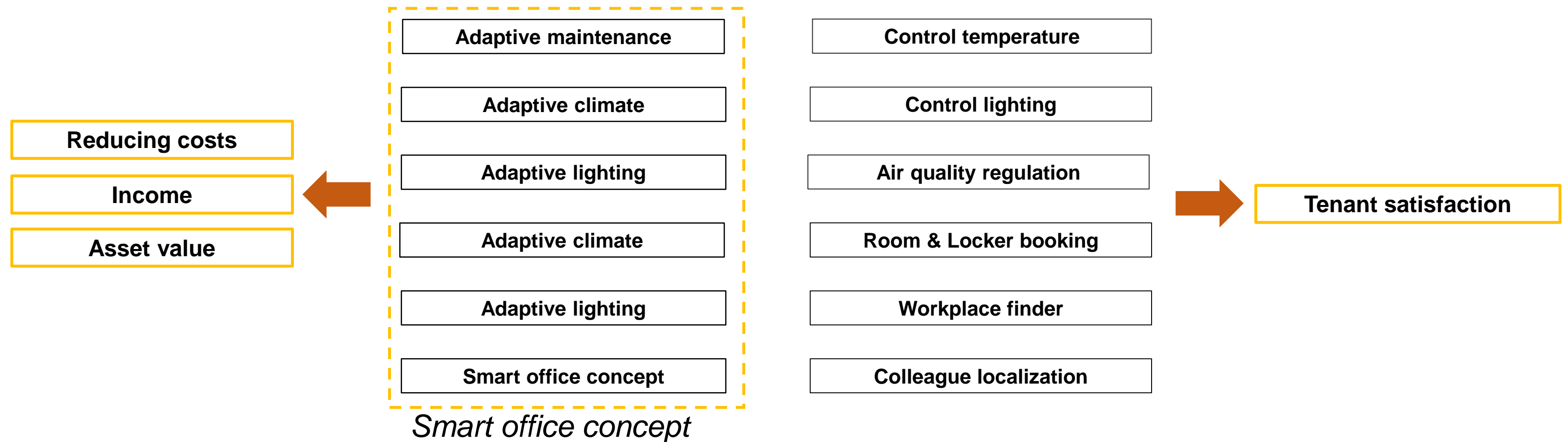
*“How can **smart technology in office buildings** provide **added value to real estate investors**?”*

Smart technology can be used to increase tenant satisfaction by contributing to employee satisfaction and productivity, increasing branding and culture

Smart technology can be used to increase operational efficiency, reducing costs, increasing sustainability and adaptability.

IN CONCLUSION

“Smart buildings can offer value depending on the goals of the stakeholder”



PERSONAL THOUGHTS

Started with the idea of a quantified model....

Had to take a more quantitative approach

I think smart offices are the future due to the benefits

But more proof is needed to convince everyone...

RECOMMENDATIONS

*A **quantified** version of the smart value map is more convincing.*

*More detailed per smart value for **specific added value goals***

*Target the (large) **tenants** (user) as investors will follow them.*

THE END

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