Survey of design support tool research in KU Leuven (P1)

1. How many architects work at your firm? _____ small firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - ○ Yes: in-house without specialised software
   - ☒ Yes: in-house with software (software: Excel sheet)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ☒ Yes: external service (EPB)
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ☒ No (reason: no data on behaviour, no certainty on growth rate and material cost)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ☒ Yes: in-house with software (software: TOTEM)
   - ○ Yes: external service
   - ○ No (reason:)

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage	x			
2	Early design stage (volume study)	x			x
3	Detailed design stage	x			x
4	Post design stage		x		

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Explanation is needed.

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Predesign

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

____8____Euro/month More build-ups, probably to make more build-ups
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

o website o magazine x colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow

Survey of design support tool research in KU Leuven (P2)

1. How many architects work at your firm? ____Large firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - X Yes: in-house without specialised software: Excel
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - X Yes: external service (EPB)
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - X Yes: external service (EPB, iPMVP certificate
   - ○ No (reason:)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: TOTEM)
   - X Yes: external service (BREAM)
   - ○ No (reason:)

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage	x			
2	Early design stage (volume study)	x	x		
3	Detailed design stage	x		x	
4	Post design stage	x			x

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

_____Euro/month Per project of 5 years : 15,000 €
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine ø colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow
An add-in/ plug-in for Revit or SketchUp for stage when walls/floor comparison are designed.

Survey of design support tool research in KU Leuven (P3)

1. How many architects work at your firm? __Large firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - X Yes: in-house without specialised software: Excel
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - X Yes: external service (EPB)
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service (
   - X No (reason: nobody knows how to do it in-house, clients don't ask for it with investment projects. Only about the initial cost.)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: TOTEM)
   - ○ Yes: external service ( )
   - X No (reason: Same reason as Q5. But clients often don't know about it enough.
   - ○

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage	yes			
2	Early design stage (volume study)	yes			
3	Detailed design stage	yes	external		
4	Post design stage	yes	external		

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Mostly as educational.

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

____50____Euro/month But, don't know the cost of software.
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine ø colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow
Link with 3D-programme

Survey of design support tool research in KU Leuven (P4)

1. How many architects work at your firm? Small firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - ○ Yes: in-house without specialised software:
   - ☒ Yes: in-house with software (software: Excel sheet)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ☒ Yes: in-house with software (software: EPB)
   - ○ Yes: external service ( )
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service (
   - ☒ No (reason: No knowledge)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: TOTEM)
   - ○ Yes: external service ( )
   - ☒ No (reason: No knowledge).

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage				
2	Early design stage (volume study)				
3	Detailed design stage	x	X (EPB specialist)		
4	Post design stage	x	X (EPB specialist)		

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

_____Euro/month
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

o website o magazine x colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow
Forms possible (L-shape, etc), for example via SketchUp.

Survey of design support tool research in KU Leuven (P5)

1. How many architects work at your firm? __6__ architect(s)

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency				x	
Sustainability				x	

3. Do you provide investment cost (IC) estimate in the design process?

   - ○ Yes: in-house without specialised software:
   - ☒ Yes: in-house with software (software: Excel)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ☒ Yes: external service (in later design stage)
   - ○ No (reason:)

     We don't have easy tools to make correct estimation.

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software:
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service (
   - ☒ No (reason: Same reason as Q4)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service ( )
   - ☒ No (reason: Same reason as Q4

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA

1	Pre-design stage				
2	Early design stage (volume study)				
3	Detailed design stage	x	X (external)		
4	Post design stage	x	X (external)		

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

___400___Euro/month
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine o colleague/friends ø other (C3A, our software supplier)

15. Please suggest any feature that would greatly help you in your current workflow
I would mainly invest in upgrading the user friendliness of the software and in visualising the result an easy to read to interpret. To be handy in the early stage of design process, it has to be very handy.

Survey of design support tool research in KU Leuven (P6)

1. How many architects work at your firm? Middle size firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency	x				
Sustainability	x				

3. Do you provide investment cost (IC) estimate in the design process?

   - ○ Yes: in-house without specialised software: Excel
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: EnergyPlus '(in-house engineers))
   - ○ Yes: external service ( )
   - ○ No (reason:)

   We don't have easy tools to make correct estimation.

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software:
   - ○ Yes: in-house with software (software: don't know, but in-house engineers)
   - ○ Yes: external service (
   - ○ No (reason:)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: don't know, but in-house engineers)
   - ○ Yes: external service ( )
   - ○ No (reason:

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage				
2	Early design stage (volume study)		X (in-HE)		
3	Detailed design stage	x	X (in-HE)	X (in-HE)	X (in-HE)
4	Post design stage	x			

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

hide other intermediate info + information button

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Pareto-front

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

Comparison options and choice part

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

_____Euro/month
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine ø colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow

- Selection of parameters: list with checkbox
- Range of parameters selection: sliders
- Visualisation of 1 or few options in Pareto front (improve Pareto Front)

Survey of design support tool research in KU Leuven (P7)

1. How many architects work at your firm? __Middle size firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - x Yes: in-house without specialised software: Excel (A)
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - x Yes: in-house with software (software: DesignBuilder (SE))
   - ○ Yes: external service ( )
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software
   - x Yes: in-house with software (software: LCC tool from EU (SE))
   - ○ Yes: external service (
   - ○ No (reason:)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - x Yes: in-house with software (software: TOTEM, Simapro (SE))
   - ○ Yes: external service ( )
   - ○ No (reason:

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage				
2	Early design stage (volume study)		SE	SE	SE
3	Detailed design stage	A	SE	SE	SE
4	Post design stage	A	SE	SE	SE

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?
Assumable other functions (office, health care)

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

_____Euro/month
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine o colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow
Link with TOTEM, perform LCA and LCA simultaneously

Survey of design support tool research in KU Leuven (P8)

1. How many architects work at your firm? __Middle size firm

2. Are you interested in energy efficient and sustainable building?

	Completely not interested	Not interested	Neutral	interested	Strongly interested
Energy efficiency					x
Sustainability					x

3. Do you provide investment cost (IC) estimate in the design process?

   - ○ Yes: in-house without specialised software: Excel (A)
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service
   - ○ No (reason:)

4. Do you provide energy estimation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: DesignBuilder (SE))
   - ○ Yes: external service ( )
   - ○ No (reason:)

5. Do you provide Life cycle costing (LCC) in the design process?

   - ○ Yes: in-house without specialised software: Excel (SE)
   - ○ Yes: in-house with software (software:)
   - ○ Yes: external service (
   - ○ No (reason:)

6. Do you provide LCA calculation in the design process?

   - ○ Yes: in-house without specialised software
   - ○ Yes: in-house with software (software: TOTEM, Simapro, VKaLCA (SE))
   - ○ Yes: external service ( )
   - ○ No (reason:

7. When do you simulate (definition of phases see introduction)?

		Investment cost	Energy	LCC	LCA
1	Pre-design stage				
2	Early design stage (volume study)		SE	SE	SE
3	Detailed design stage	A	SE	SE	SE
4	Post design stage	A	SE	SE	SE

8. Are you interested in the presented tool?

Completely not interested	Not interested	Neutral	interested	Strongly interested

9. What do you think about data input? (user-friendly?)

More info on numbers + colours could be useful

Poor	Fair	Good	Very good	Excellent

10. What do you think about visualisation for output?

Poor	Fair	Good	Very good	Excellent

11. Is this tool to be integrated in the design process?

Poor	Fair	Good	Very good	Excellent

12. To what extent is this tool useful in your early design stage?

But for other functions/typologies

Poor	Fair	Good	Very good	Excellent

13. How much would you be willing to pay for it (if subscription /month)?

_____Euro/month
(including: software (copy protected), training video, 2 hours telephonic support, yearly update (upwards compatible), planned increased functionality, …)

14. Where do you get information about software (CAD, BIM, 3D, simulation etc…)

ø website o magazine ø colleague/friends o other ( )

15. Please suggest any feature that would greatly help you in your current workflow
Benchmark included