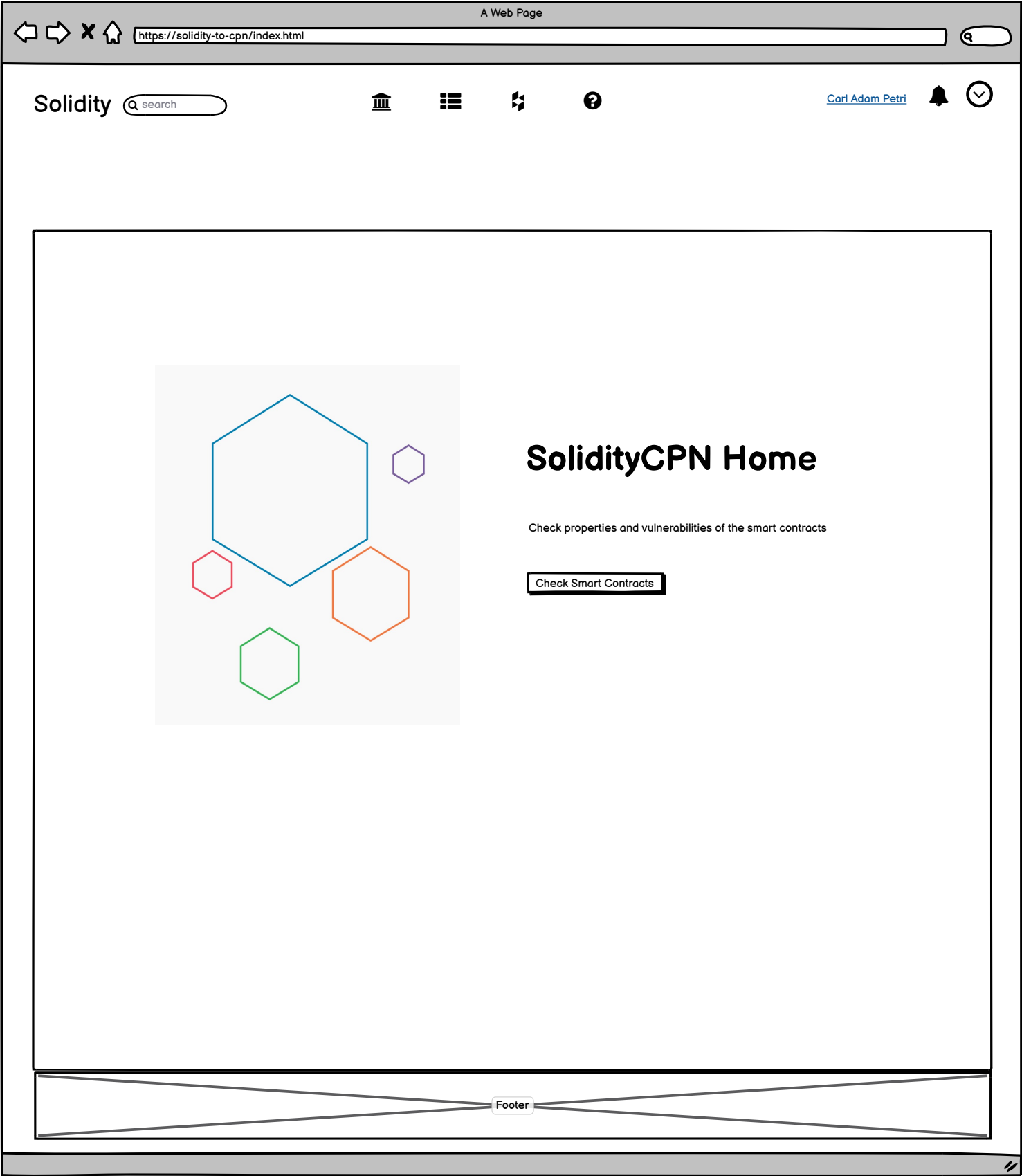
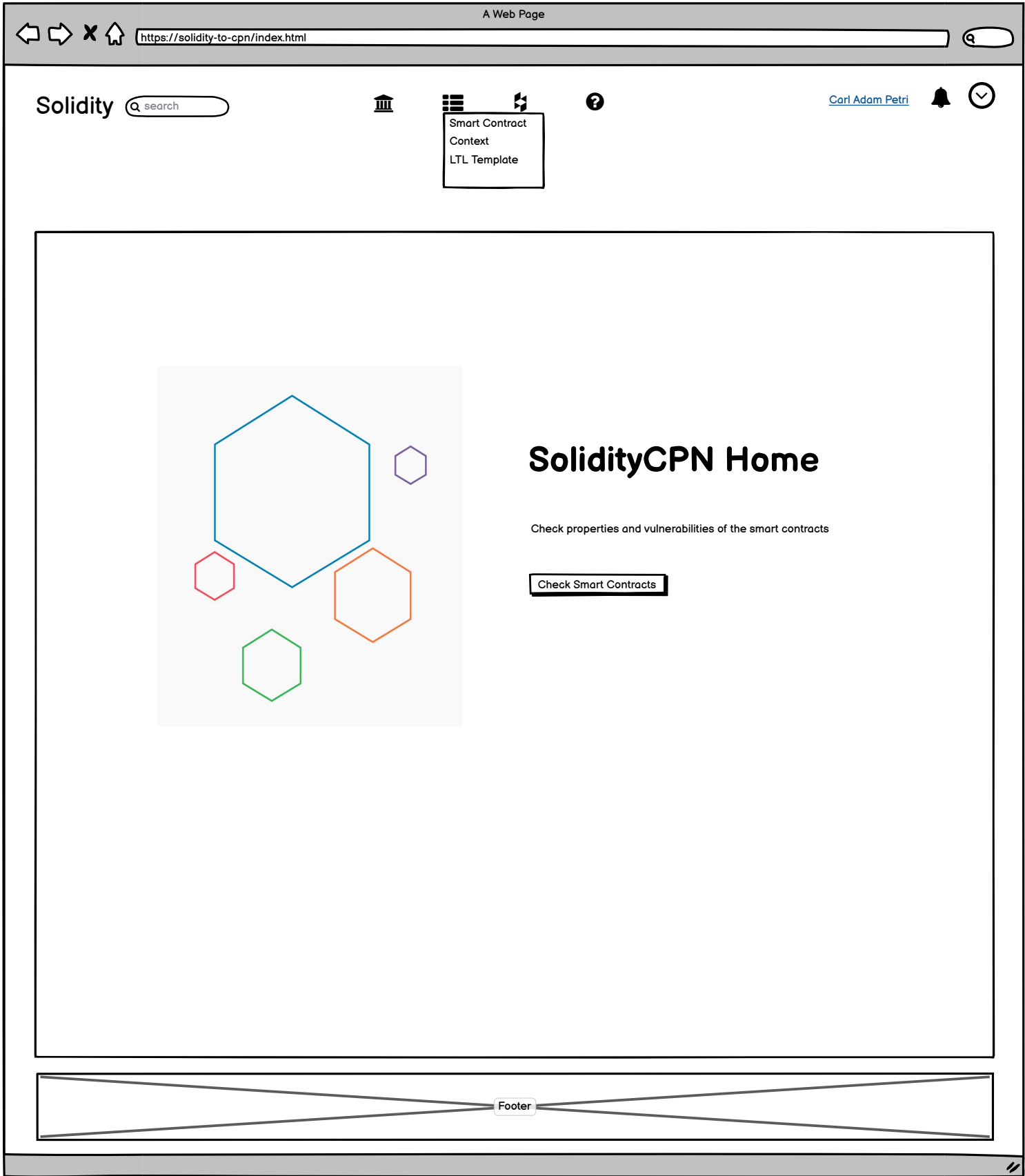


1



1



2

←

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https://solidity-to-cpn/select-sc.html

🔍

A Web Page

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Vulnerability

Generate SC to CPN

Check the SCs

Finished

☰

↺

Checked Smart Contract List

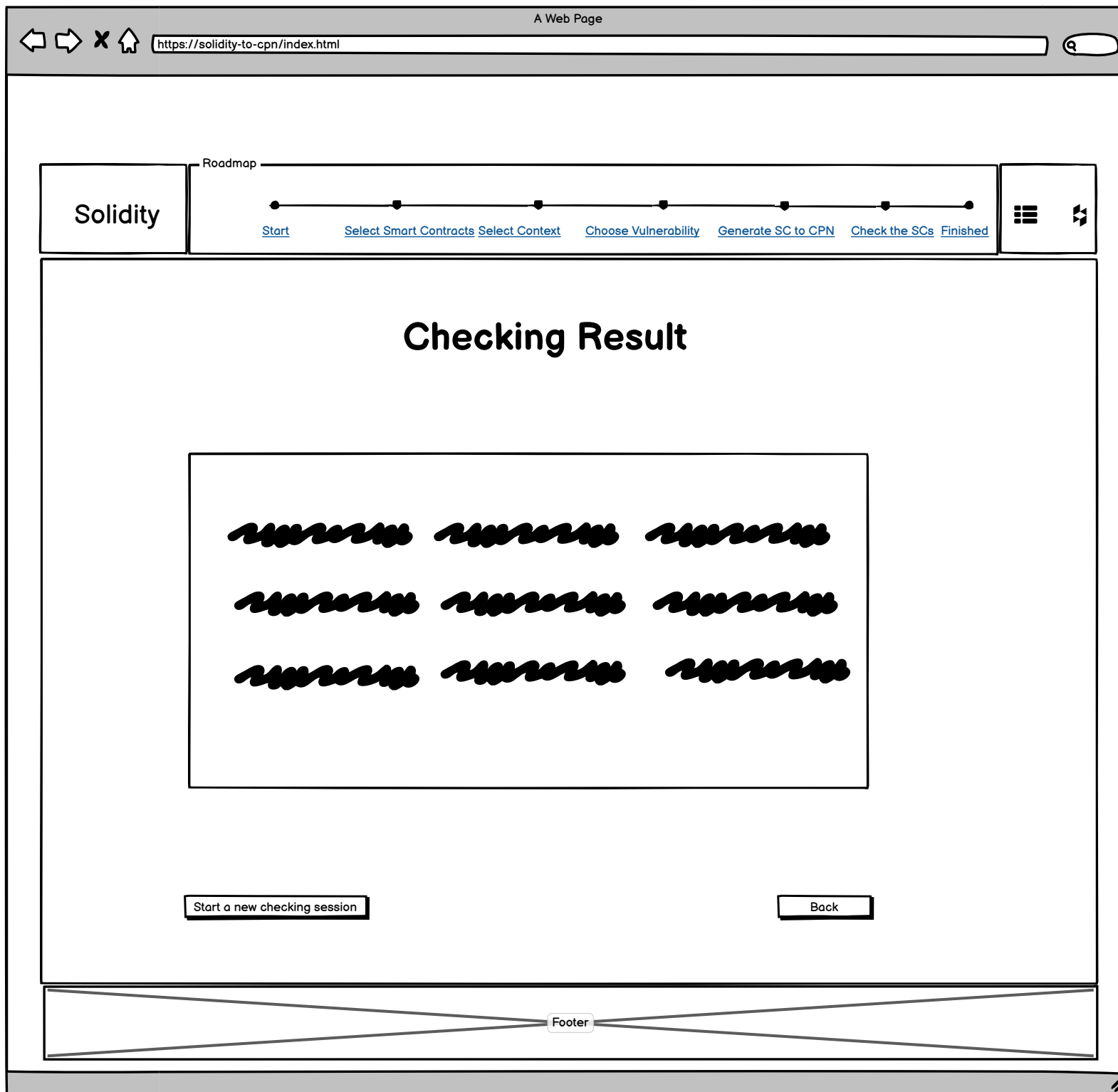
#	Checker	Checked Date	Number of smart contracts
1	David	09/10/2021	3
2	Jaime		
3	Billy		
4	Ikram	06/10/2021	2
5	Thomas	05/10/2021	1
6	Alex	04/10/2021	3
7	Micheal	03/10/2021	1
...	...		

Start a new checking session

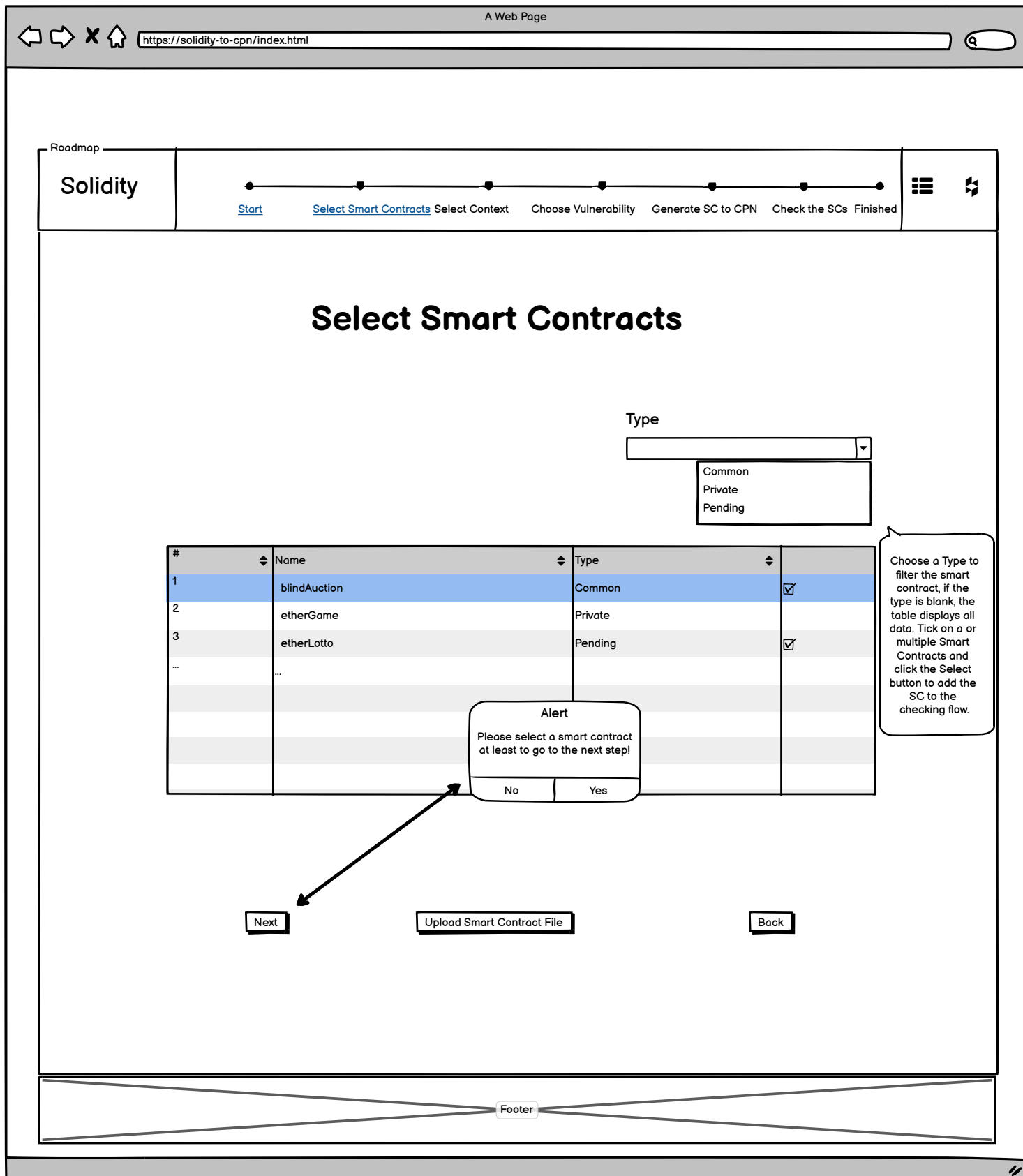
Back

Footer

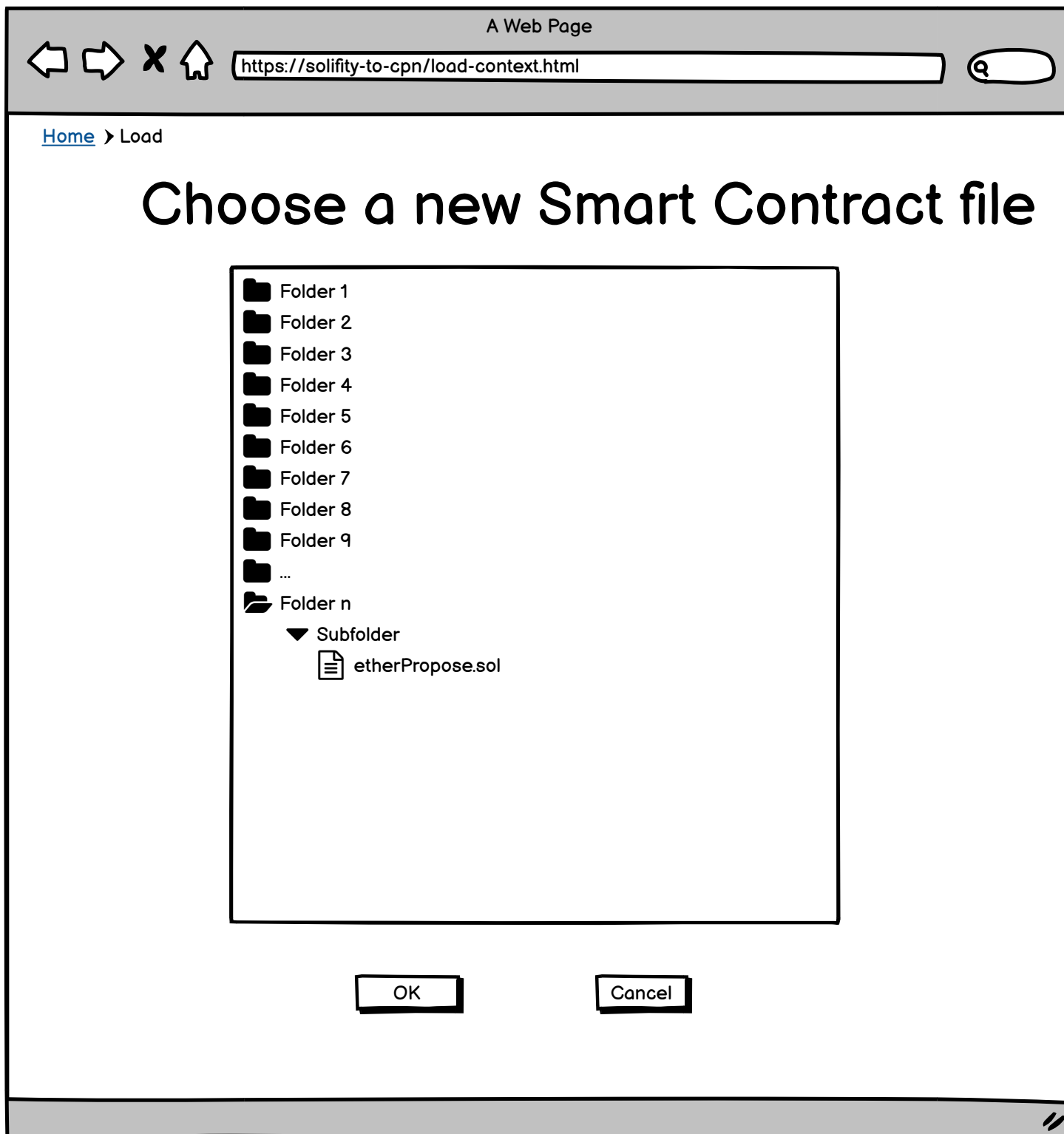
3



4



4a



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A Web Page

https://solifity-to-cpn/upload-sc.html

Home > Upload





Upload a new Smart Contract code

Name

Smart Contract Type ☐ Pending ☒ Private

Normal user can request to change a private smart contract to become a common one.
Default is Private

B I U

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A Web Page

https://solidity-to-cpn/context.html

🔍

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Vulnerability

Generate SC to CPN

Check the SCs

Finished

☰

↺

Select Context

Name

Gaming

- Medicine

- Gaming

- ...

- Lotto

Type

DCR

Description

There are several options:

· BPMN: The user will choose the BPMN context by clicking on the "Load a Context" button.

· DCR: The user will choose the DCR context by clicking on the "Load a Context" button.

· ...

· Free

Next

Upload a Context file

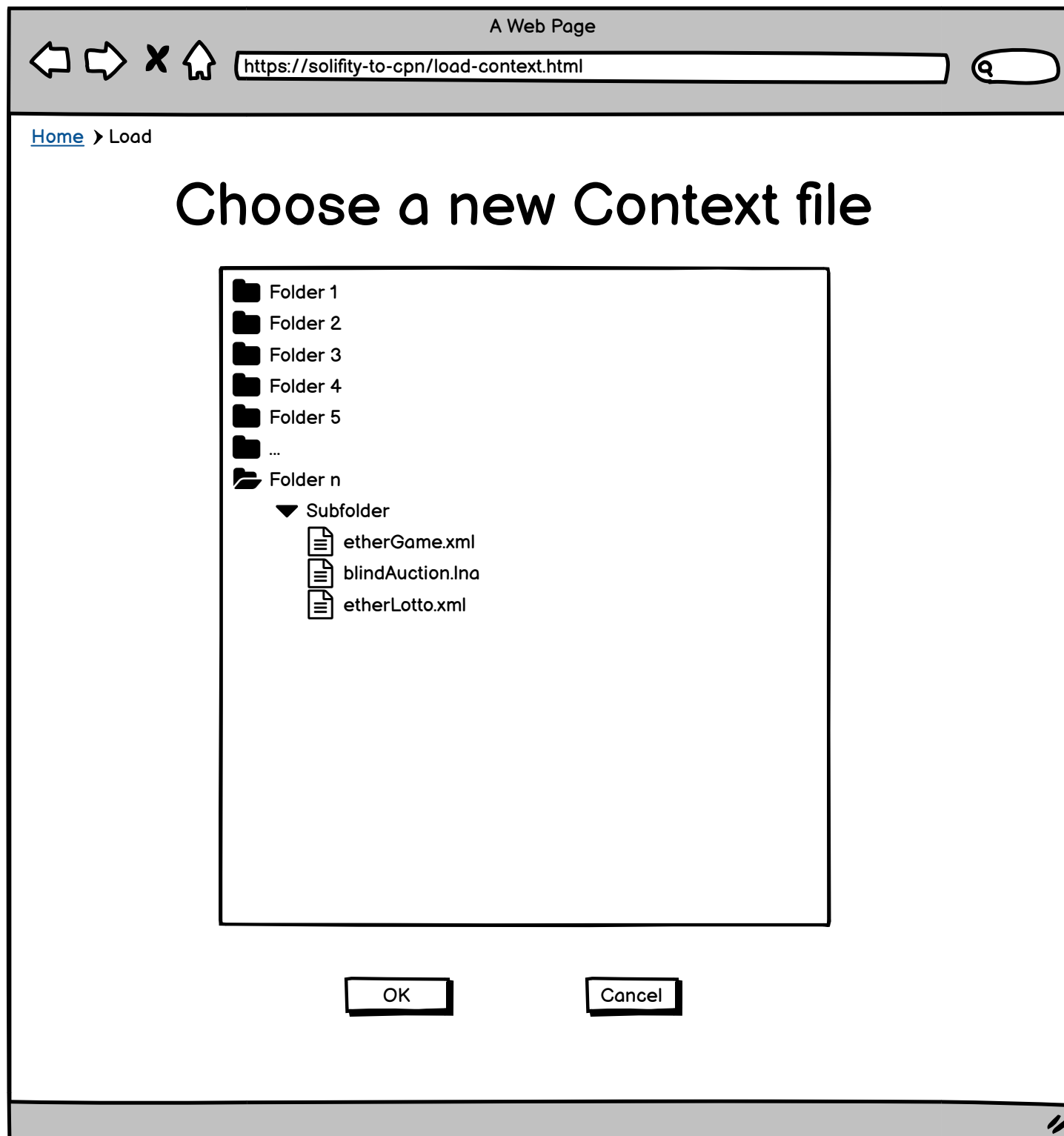
Skip

Back

If the user does not choose a context here, and click Skip, it means the user chooses the free-context

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A Web Page

https://solify-to-cpn/upload-sc.html

[Home](#) > Upload

Upload a new Context file

Name

Type

- DCR
- CPN
- ...

If the user chooses the CPN context, it means the CPN file (.lna) will be uploaded (the system does not need to run DCR2CPN tool to convert a xml file to a lna file.)

Content

Description

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A Web Page

https://solidity-to-cpn/ltlformula.html

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Roadmap

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[Start](#)

[Select Smart Contracts](#)

[Select Context](#)

[Choose Property](#)

Generate SC to CPN

Check the SCs

Finished

☰

🔗

LTL Checking Options

Please choose your way to check the Smart Contracts:

- Contract-Specific Property: You will choose the functions and using template or non-template to design your LTL formula.
- General Vulnerability: You will select the common vulnerability from the list.

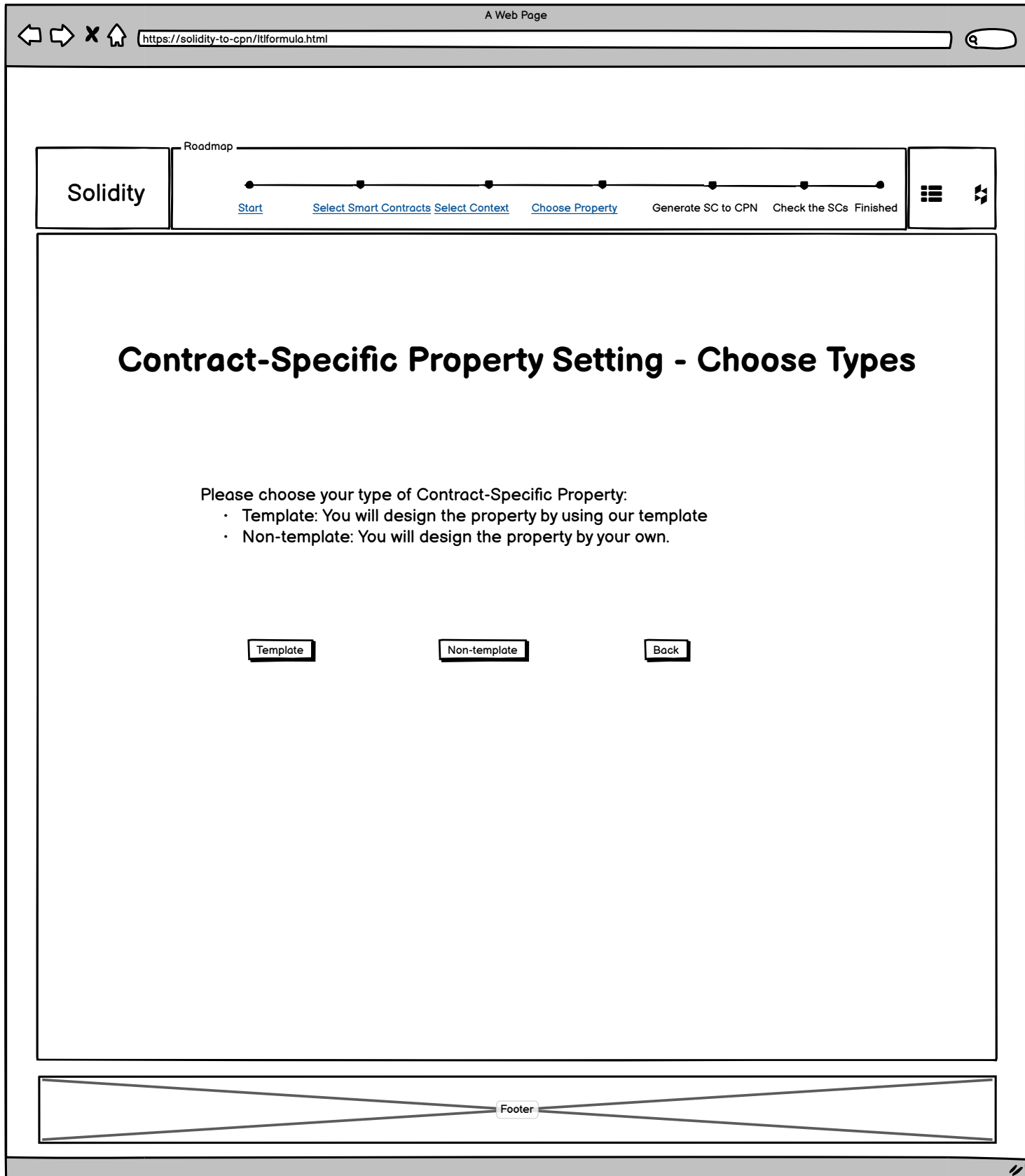
Check a Contract-Specific Property

Check a General Vulnerability

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https://solidity-to-cpn/ltformula.html

🔍

A Web Page

Solidity

Roadmap

[Start](#)[Select Smart Contracts](#)[Select Context](#)[Choose Property](#)[Generate SC to CPN](#)[Check the SCs](#)

☰

⚡

Contract-Specific Property Setting - Template

Name

Mutual exclusion

Template

Template 1

Template 1

Template 2

Template 3

Template 4

Template 5

...

Others

Formula

(GF{ [local variable 1](#) } ^ GF{ [global variable 2](#) }) => G({ [local variable 2](#) }=> F{ [smart contract](#) })

Click on the [variable](#) or [function](#) or [argument](#) to choose the right one in the smart contract

Description

If [variable 1](#) occurs infinitely often and [variable 2](#) occurs infinitely often, then each occurrence of [function3](#) is followed by an occurrence of [function 4](#)

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A Web Page

X

https://solidity-to-cpn/add-segmented-sc.html

Q

[Back to home](#)

Select smart contracts

#	Smart Contract name	Selected
1	Smart Contract 1	<input checked="" type="radio"/>
2	Smart Contract 2	<input type="radio"/>
3	Smart Contract 3	<input type="radio"/>
4	Smart Contract 4	<input type="radio"/>
...		

OK

Cancel

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A Web Page

https://solidity-to-cpn/add-segmented-sc.html

[Back to home](#)

Select global variables of the smart contract

Smart Contract 1Smart Contract 2Smart Contract 3

#	Global variables	Selected
1	GV1	<input checked="" type="radio"/>
2	GV2	<input type="radio"/>
3	GV3	<input type="radio"/>
4	GV4	<input type="radio"/>
...		

OK

Cancel

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A Web Page

X

https://solidity-to-cpn/add-segmented-sc.html

Q

[Back to home](#)

Select functions of the smart contract

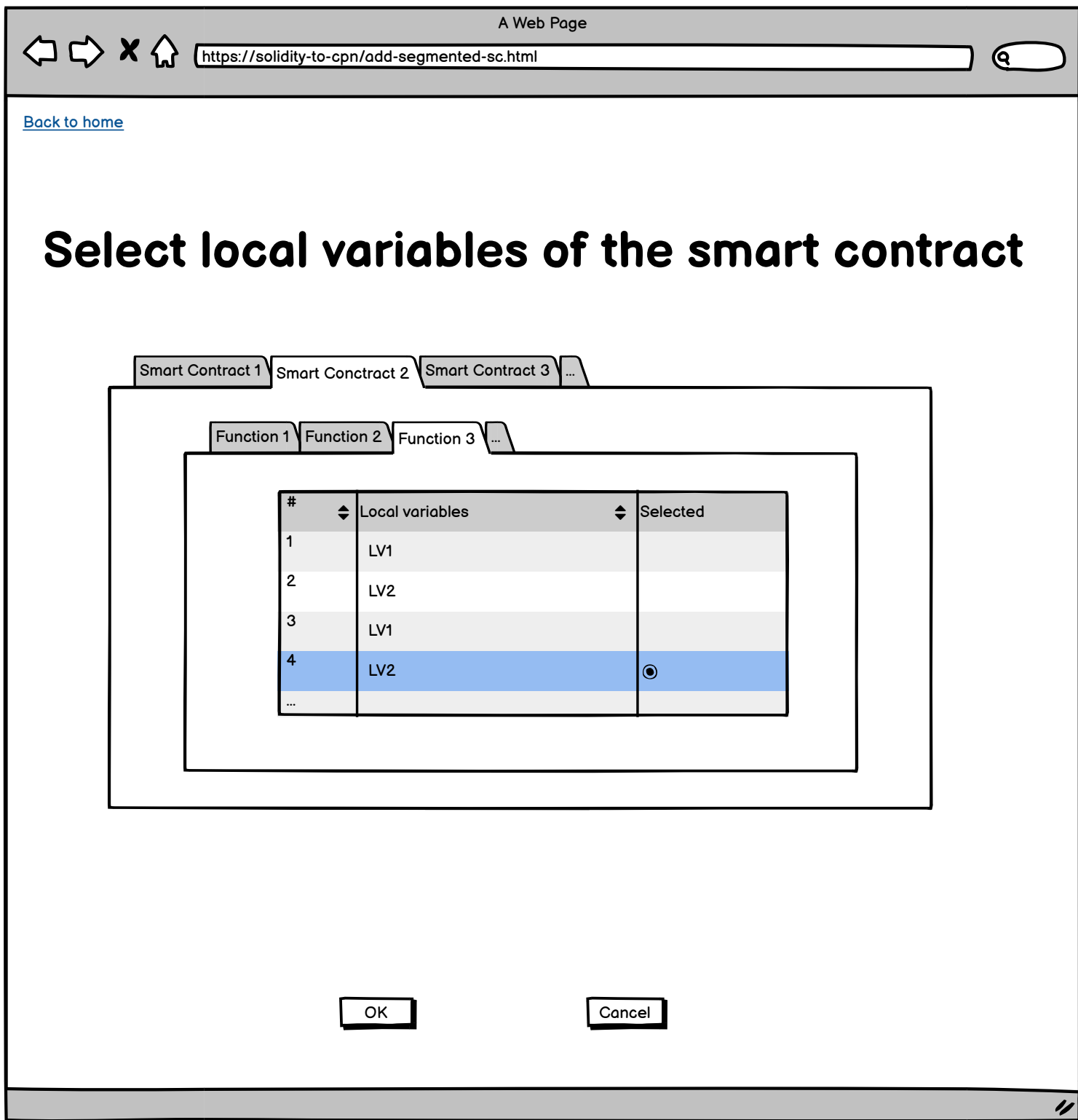
Smart Contract 1Smart Contract 2Smart Contract 3...

#	Functions	Selected
1	Function 1	
2	Function 2	
3	Function 3	
4	Function 4	<input checked="" type="radio"/>
...		

OK

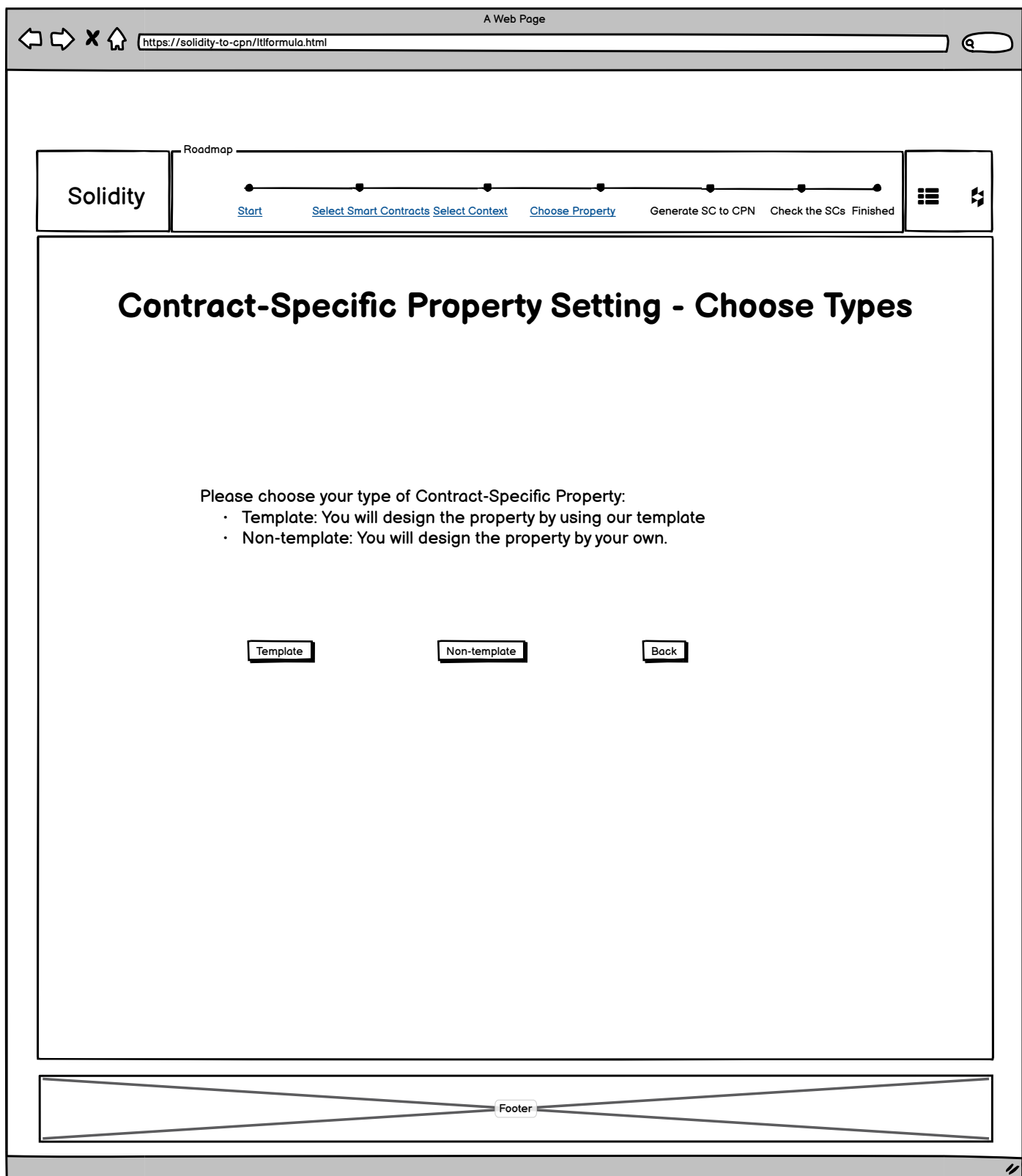
Cancel

14

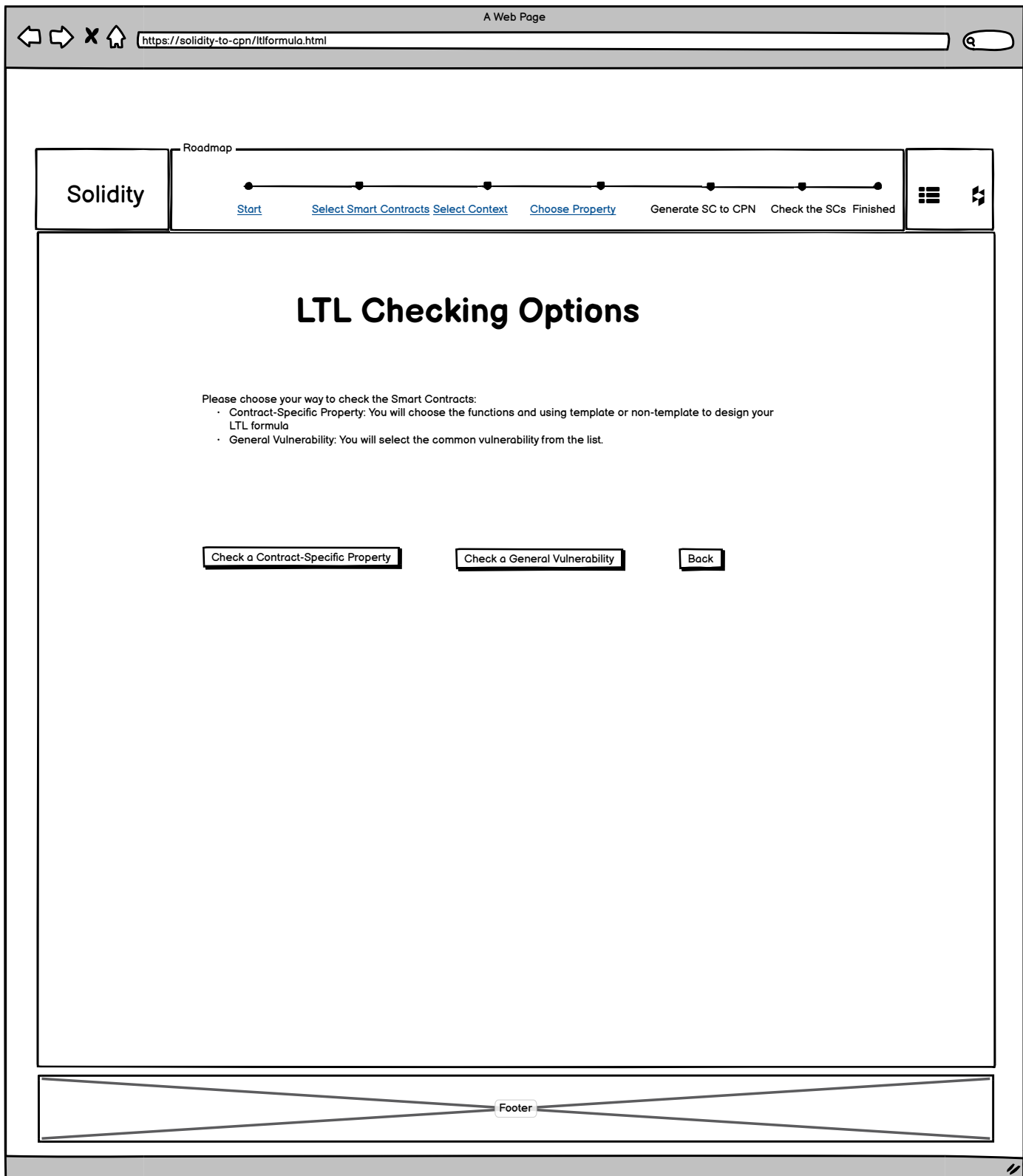


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A Web Page

https://solidity-to-cpn/ltformula.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰

↺

General Vulnerability Setting

Vulnerability

Integer Overflow/Underflow

If the user choose Integer Overflow/Underflow or Unitialized Storage Literal the system will display a windows for the user to choose a variable to insert to the formula

Integer Overflow/Underflow

Reentrancy

Self-destruction

Timestamp Dependence

Skip Empty String Literal

Uninitialized Storage Variable

Others

Description

outOfRange(x) = (x < minThreshold) V (x > maxThreshold)

Next

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Footer

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https://solidity-to-cpn/ltformula.html

🔍

A Web Page

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰ ☲

Select variables of the function

Smart Contract 1

Smart Contract 2

Smart Contract 3

...

#	Global variables	Selected
1	GV1	
2	GV2	
3	GV3	
4	GV4	<input checked="" type="radio"/>
...		

Function 1

Function 2

...

#	Local variables	Selected
1	LV1	
2	LV2	
3	LV3	
4	LV4	
...		

Next

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A Web Page

https://solidity-to-cpn/ltformula.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰

↺

General Vulnerability Setting

Vulnerability

Reentrancy

Integer Overflow/Underflow

Reentrancy

Self-destruction

Timestamp Dependence

Skip Empty String Literal

Uninitialized Storage Variable

Others

Description

There are two options for the reentrancy vulnerability:

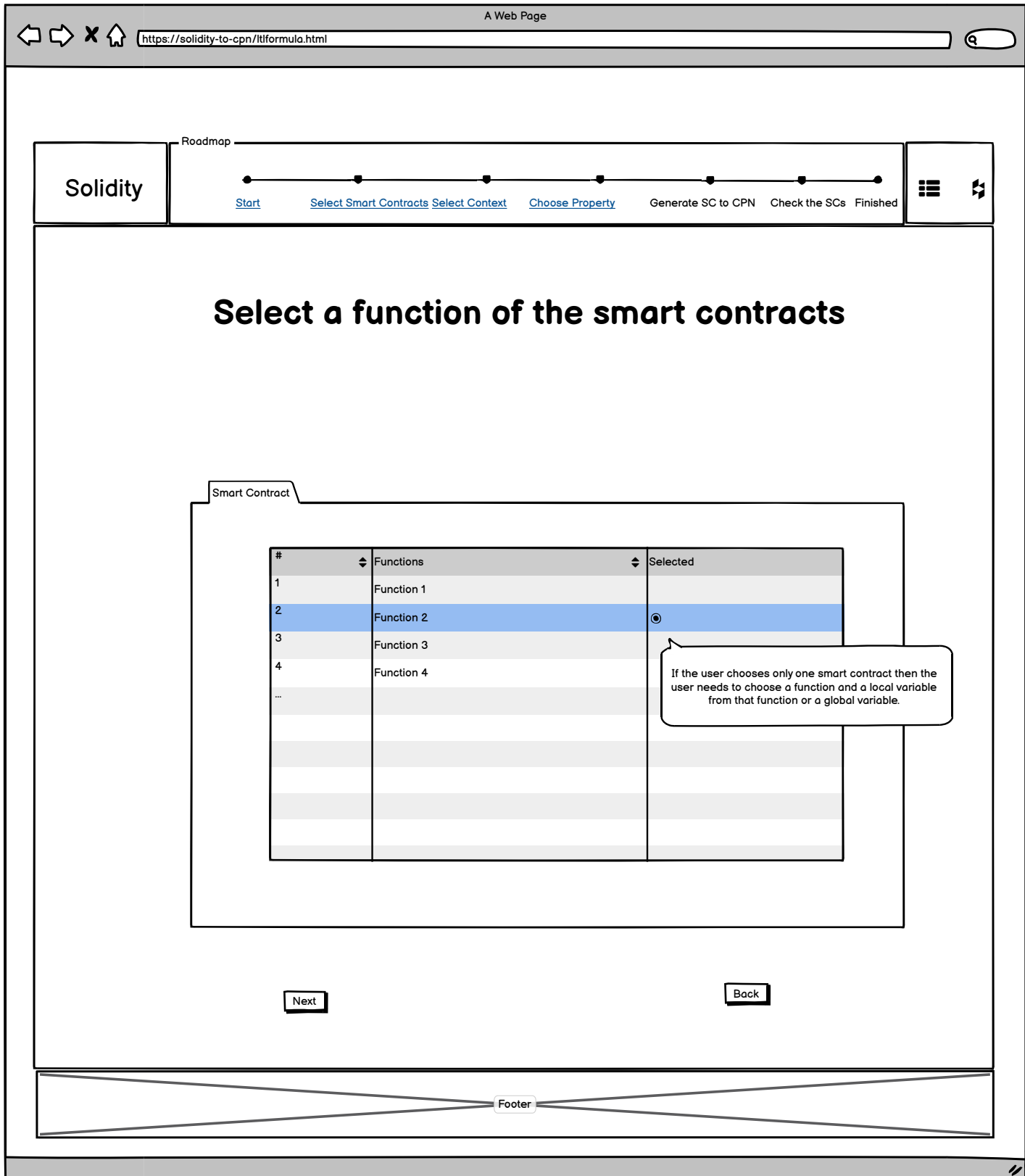
• If the user chooses only one smart contract then the user needs to choose a function and a local variable from that function or a global variable.

• If the user chooses more than one smart contract, then the user needs to choose a smart contract Si, a function Fi from that smart contract Si. If he knows which smart contract Sj, will be interacting with, he selects it. If he doesn't, he needs to choose a local variable from the function he had selected Fi or a global variable from Si.

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A Web Page

https://solidity-to-cpn/ltformula.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰

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Select variables of the selected function

#	Global variable	Selected
1	Global Variable 1	
2	Global Variable 2	<input checked="" type="radio"/>
3	Global Variable 3	
4	Global Variable 4	

Function 2

#	Local variable	Selected
1	Local Variable 1	
2	Local Variable 2	
...		

Next

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Select functions of the smart contracts

Smart Contract 1 Smart Contract 2...

#	Functions	Selected
1	Function 1	
2	Function 2	<input checked="" type="radio"/>
3	Function 3	
4	Function 4	
...		

If the user chooses more than one smart contract, then the user needs to choose a smart contract S_i , a function F_i from that smart contract S_i . If he knows which smart contract S_j , will be interacting with, he selects it. If he doesn't, he needs to choose a local variable from the function he had selected F_i or a global variable from S_i .

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A Web Page

https://solidity-to-cpn/select-sc.html

Q

[Back to home](#)

Select smart contracts

#	Smart Contract name	Selected
1	Smart Contract 2	<input checked="" type="radio"/>
2	Smart Contract 3	<input type="radio"/>
...		

Next

Skip

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https://solidity-to-cpn/ltlformula.html

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A Web Page

Solidity

Roadmap

[Start](#)[Select Smart Contracts](#)[Select Context](#)[Choose Property](#)[Generate SC to CPN](#)[Check the SCs](#)[Finished](#)

☰↺

Select a variable of the selected function

#	Global variable	Selected
1	Global Variable 1	
2	Global Variable 2	
3	Global Variable 3	
...		

Function 2

#	Local variable	Selected
1	Local Variable 1	
2	Local Variable 2	<input checked="" type="radio"/>
...		

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A Web Page

https://solidity-to-cpn/ltformula.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰ ⚙

General Vulnerabilty Setting

Vulnerability

Timestamp Dependence

If the user chooses Timestamp Dependence, Skip Empty String Literal then the system will display the functions for the users to choose

Integer Overflow/Underflow

Reentrancy

Self-destruction

Timestamp Dependence

Skip Empty String Literal

Uninitialized Storage Variable

Others

Description

Since the execution on a Blockchain needs to be deterministic for all the miners to get the same results and reach a consensus, users usually resort to block-related variables such as timestamp as a source of entropy.

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Solidity

Roadmap

[Start](#) [Select Smart Contracts](#) [Select Context](#) [Choose Property](#) [Generate SC to CPN](#) [Check the SCs](#) [Finished](#)

Select functions of the smart contracts

Smart Contract 1 Smart Contract 2 ...

#	Functions	Selected
1	Function 1	
2	Function 2	<input checked="" type="radio"/>
3	Function 3	
4	Function 4	
...		

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Roadmap

[Start](#)

[Select Smart Contracts](#)

[Select Context](#)

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Generate SC to CPN

Check the SCs

Finished

☰

⚡

General Vulnerability Setting

Vulnerability

Self-Destruction

Integer Overflow/Underflow

Reentrancy

Self-destruction

Timestamp Dependence

Skip Empty String Literal

Uninitialized Storage Variable

Others

Description

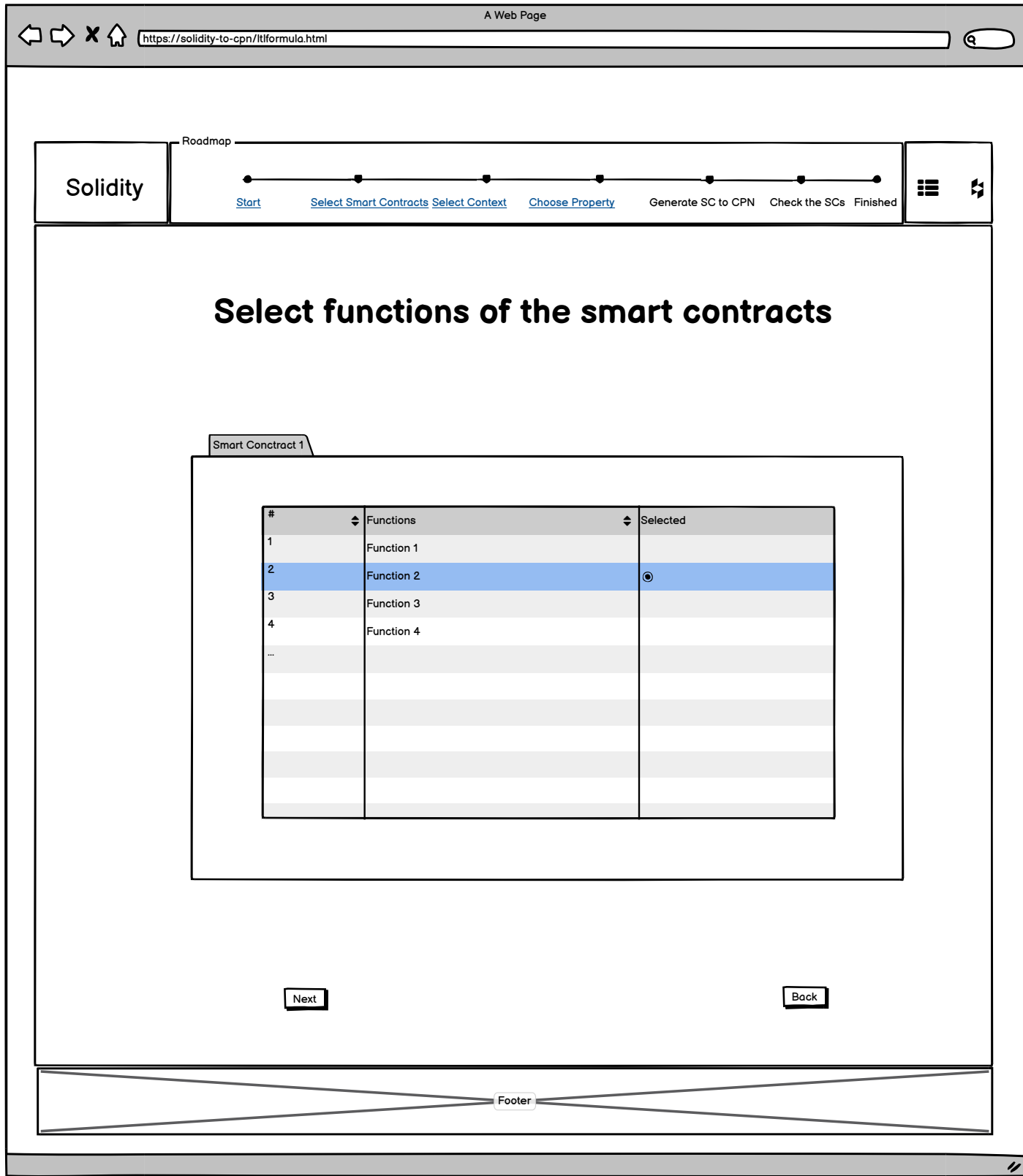
There are 2 options:

- The user chooses only one smart contract then the user needs to choose a function in the smart contract for the vulnerability.
- If the user chooses more than one smart contract and after choosing a function in the first one the user chooses another smart contract, the system will go to option 2 of Self-destruction (2 functions). If the user does not choose any function, the system goes to option 1 (only one function is chosen)

Next

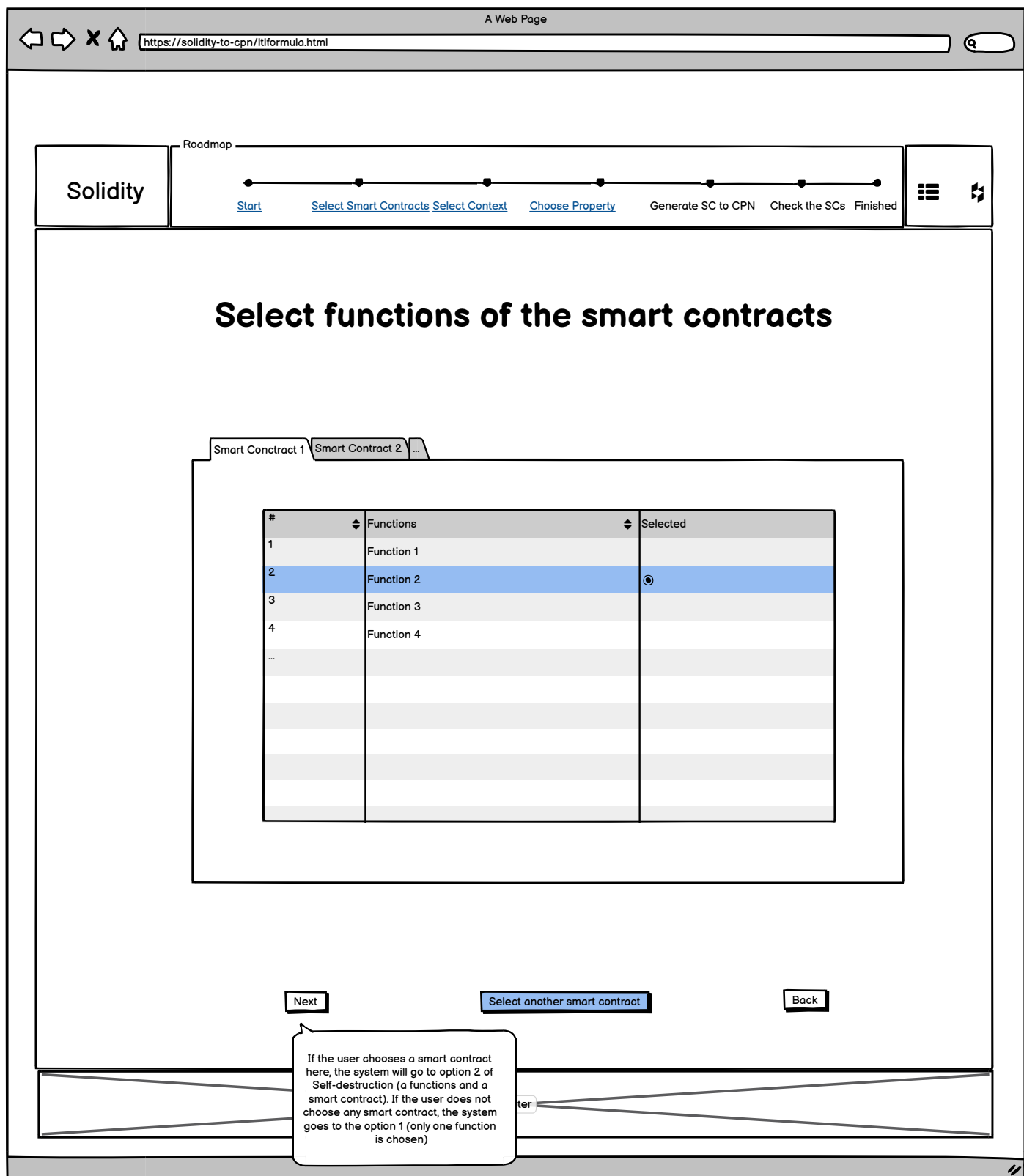
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https://solidity-to-cpn/ltlformula.html

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Solidity

Roadmap

[Start](#)[Select Smart Contracts](#)[Select Context](#)[Choose Property](#)Generate SC to CPNCheck the SCsFinished

☰↺

Select smart contracts

#	Smart Contract Name	Selected
1	Smart Contract 2	
2	Smart Contract 3	
3	Smart Contract 4	<input checked="" type="radio"/>
...		

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A Web Page

https://solidity-to-cpn/initialmarking.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰

🔄

Configuration

Number of users

5

☒ Fixed

☐ Random

☐ Map

Balance

10

Smart Contract 1

Smart Contract 2

Smart Contract 3

...

Function parameters

#	Functions	Arguments
1	Function 1	Input Params
2	Function 2	Input Params
3	Function 3	Input Params
4	Function 4	Input Params
...		

Next

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https://solidity-to-cpn/initialmarking.html

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A Web Page

Solidity

Roadmap

[Start](#)[Select Smart Contracts](#)[Select Context](#)[Choose Property](#)[Generate SC to CPN](#)[Check the SCs](#)[Finished](#)

☰⚡

Configuration

Number of users

☐ Fixed

☒ Random

☐ Map

Balance

From

To

Function parameters

Smart Contract 1Smart Contract 2Smart Contract 3...

#	Functions	Arguments
1	Function 1	Input Params
2	Function 2	Input Params
3	Function 3	Input Params
4	Function 4	Input Params
...		

Next

Back

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A Web Page

X

https://solidity-to-cpn/initialmarking.html

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

Configuration

Number of users

5

☐ Fixed

☐ Random

☒ Map

Balance

1,2,3,4,5

Function parameters

Smart Contract 1

Smart Contract 2

Smart Contract 3

...

#	Functions	Arguments
1	Function 1	Input Params
2	Function 2	Input Params
3	Function 3	Input Params
4	Function 4	Input Params
...		

Next

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A Web Page

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https://solidity-to-cpn/initialmarking.html

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Solidity

Roadmap

[Start](#)

[Select Smart Contracts](#)

[Select Context](#)

[Choose Property](#)

Generate SC to CPN

Check the SCs

Finished

☰

↔

Input Parameters

Sender value

2

 To

10

#	Parameters	Range
1	Argument 1	<div><div>1</div></div> To <div><div>5</div></div>
2	Argument 2	<div><div>1</div></div> To <div><div>5</div></div>
...		

Next

Back

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https://solidity-to-cpn/initialmarking.html

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A Web Page

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

☰

↺

Configuration

Type

☐ Fixed

☐ Random

☒ Map

User parameters

#	User	Balance
1	User 1	1
2	User 2	3
3	User 3	2
4	User 4	5
5	User 5	4
...		

Function parameters

Smart Contract 1

Smart Contract 2

Smart Contract 3

...

Function 1

Function 2

...

Sender value

2

To

10

#	Argument	Value
1	Argument 1	3
2	Argument 2	5
...		

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Solidity

Roadmap

[Start](#) [Select Smart Contracts](#) [Select Context](#) [Choose Property](#) [Generate SC to CPN](#) [Check the SCs](#) [Finished](#)

☰

↺

Generating CPN Model

Smart Contracts

#	Contract Name
1	blindAuction
2	etherLotto
3	etherGame
4	...

Context

Gaming

LTL Property

Integer Overflow

Configuration

[Link to the setting configuration](#)

The smart contract is generating...

Generate

Back

When the user clicks on this button, the system will call the DCR2CPN tool to generate the context file, and then call the unfolding tool to generate the HCPN file to add atomic proposition to the HCPN file and create the property file (the input for Helena tool)

← → × ↶

A Web Page

https://solidity-to-cpn/index.html

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Solidity

Roadmap

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[Start](#) [Select Smart Contracts](#) [Select Context](#) [Choose Property](#) [Generate SC to CPN](#) [Check the SCs](#) [Finished](#)

☰ ⚡

Generating CPN Model

Smart Contracts

#	Contract Name
1	blindAuction
2	etherLotto
3	etherGame
4	...

Context

Gaming

LTL Property

Integer Overflow

Configuration

[Link to the setting configuration](#)

The generating process completed successfully

Next

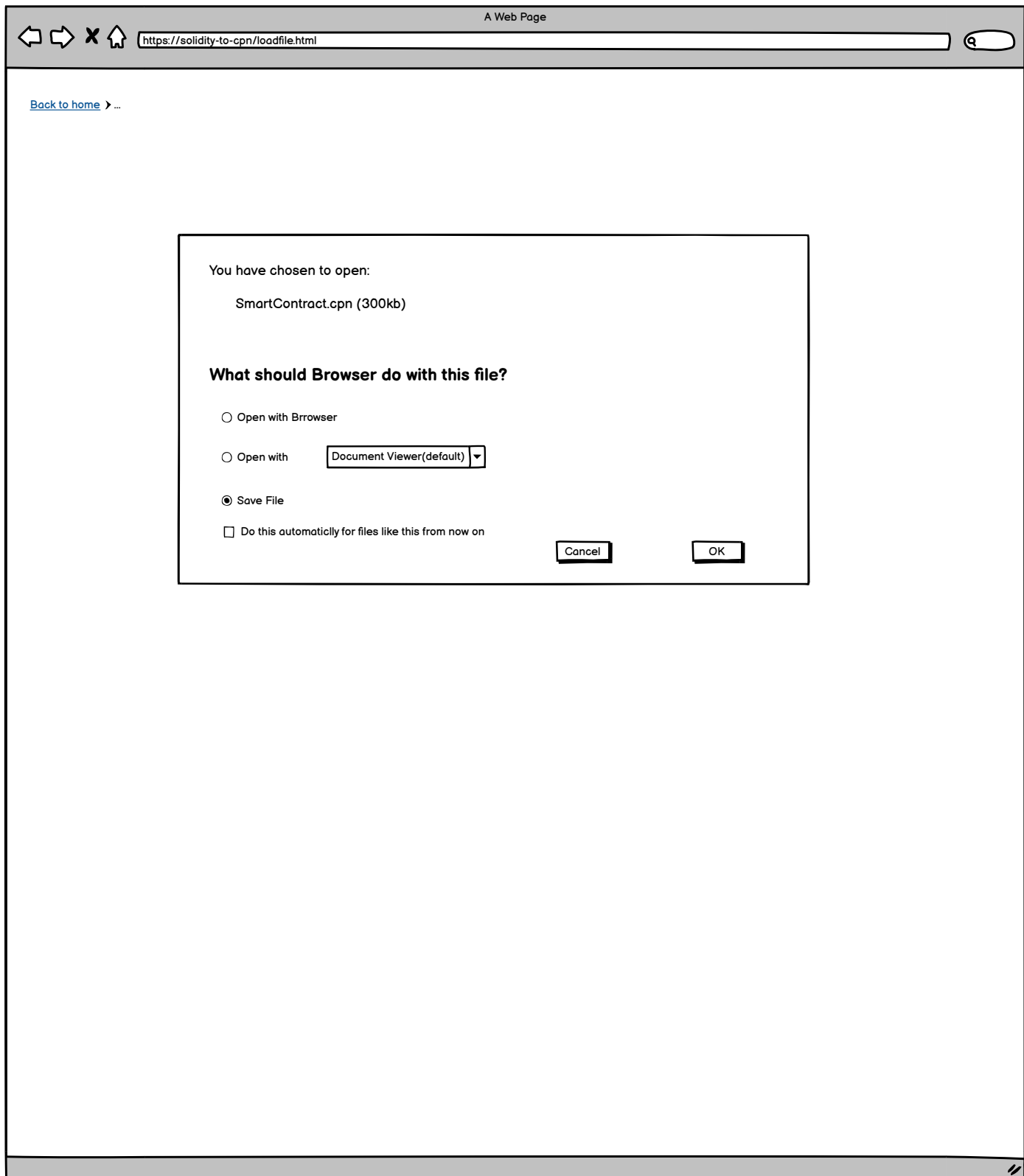
Download

Back

Click on "Download" button to download the CPN generated files

Footer

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A Web Page

https://solidity-to-cpn/index.html

Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Property

Generate SC to CPN

Check the SCs

Finished

Checking Smart Contracts

Smart Contracts

#	Contract Name
1	blindAuction
2	etherLotto
3	etherGame
4	...

Context

Gaming

LTL Property

Integer Overflow

Configuration

[Link to the setting configuration](#)

Check

Back

Footer

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A Web Page

https://solidity-to-cpn/index.html

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Solidity

Roadmap

Start

Select Smart Contracts

Select Context

Choose Vulnerability

Generate SC to CPN

Check the SCs

Finished

☰ ⚡

Checking Smart Contracts

Smart Contracts

#	Contract Name
1	blindAuction
2	etherLotto
3	etherGame
4	...

Context

Gaming

LTL Property

Integer Overflow

Configuration

[Link to the setting configuration](#)

The smart contract is checking...

Check

Back

When the user clicks on this button, the system will call the Helena tool to check the CPN file generated by tools in the previous steps and get the result from the Helena tool to show on the screen for the user.

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A Web Page

https://solidity-to-cpn/index.html

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Solidity

Roadmap

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●

●

[Start](#)[Select Smart Contracts](#)[Select Context](#)[Choose Vulnerability](#)[Generate SC to CPN](#)[Check the SCs](#)Finished

☰☱

Checking Smart Contracts

Smart Contracts

#	Contract Name
1	blindAuction
2	etherLotto
3	etherGame
4	...

Context

Gaming

LTL Property

Integer Overflow

Configuration

[Link to the setting configuration](#)

The checking process completed successfully

Check

Back

Footer

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The smart contract CRUD page of Admin

[Home](#) ➤ List

10/10/2021

OCTOBER 2021						
S	M	T	W	T	F	S
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

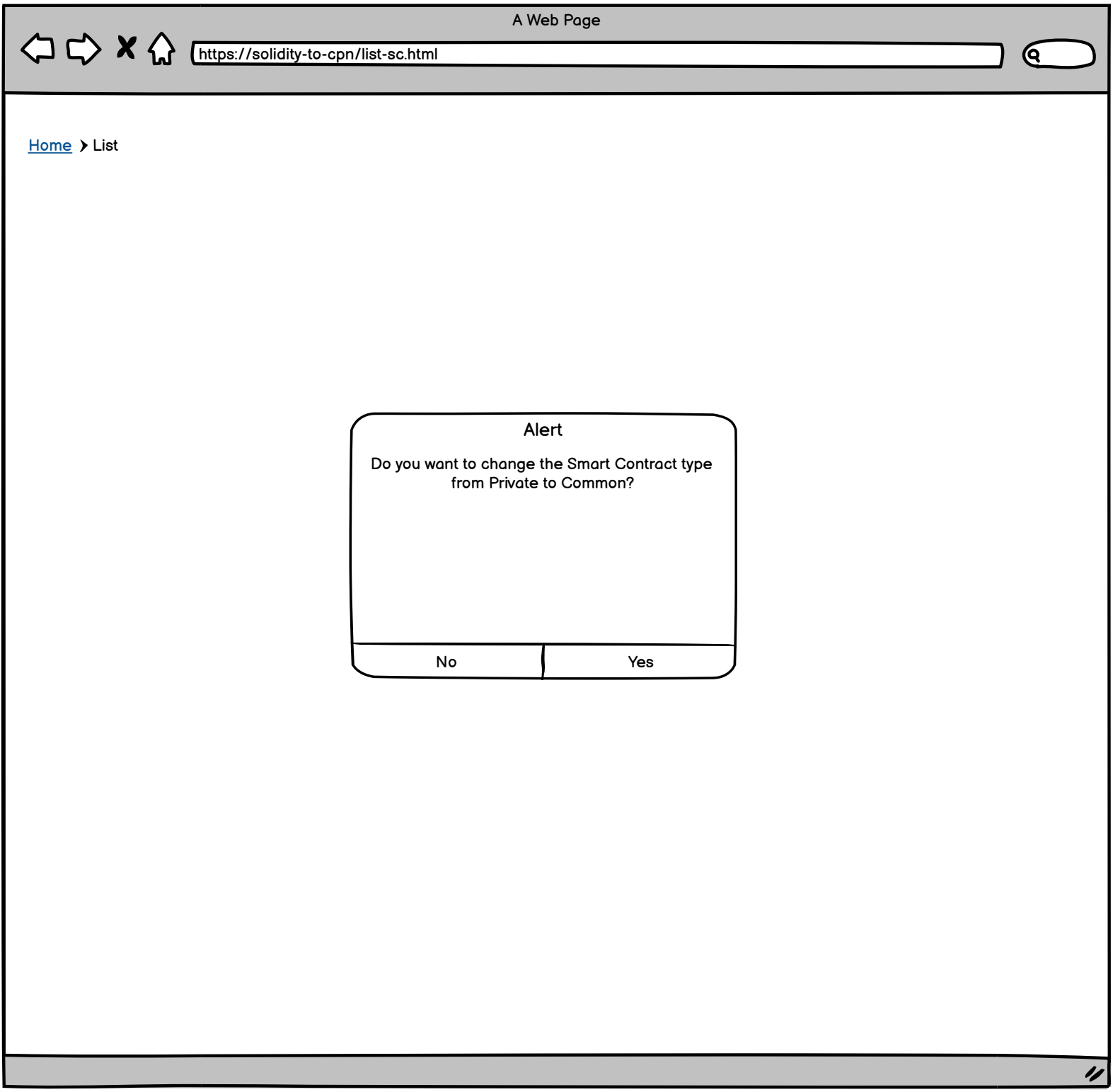
Pending	
---------	--

Only Admin can see the private smart contracts that are requested to be common ones (Pending)

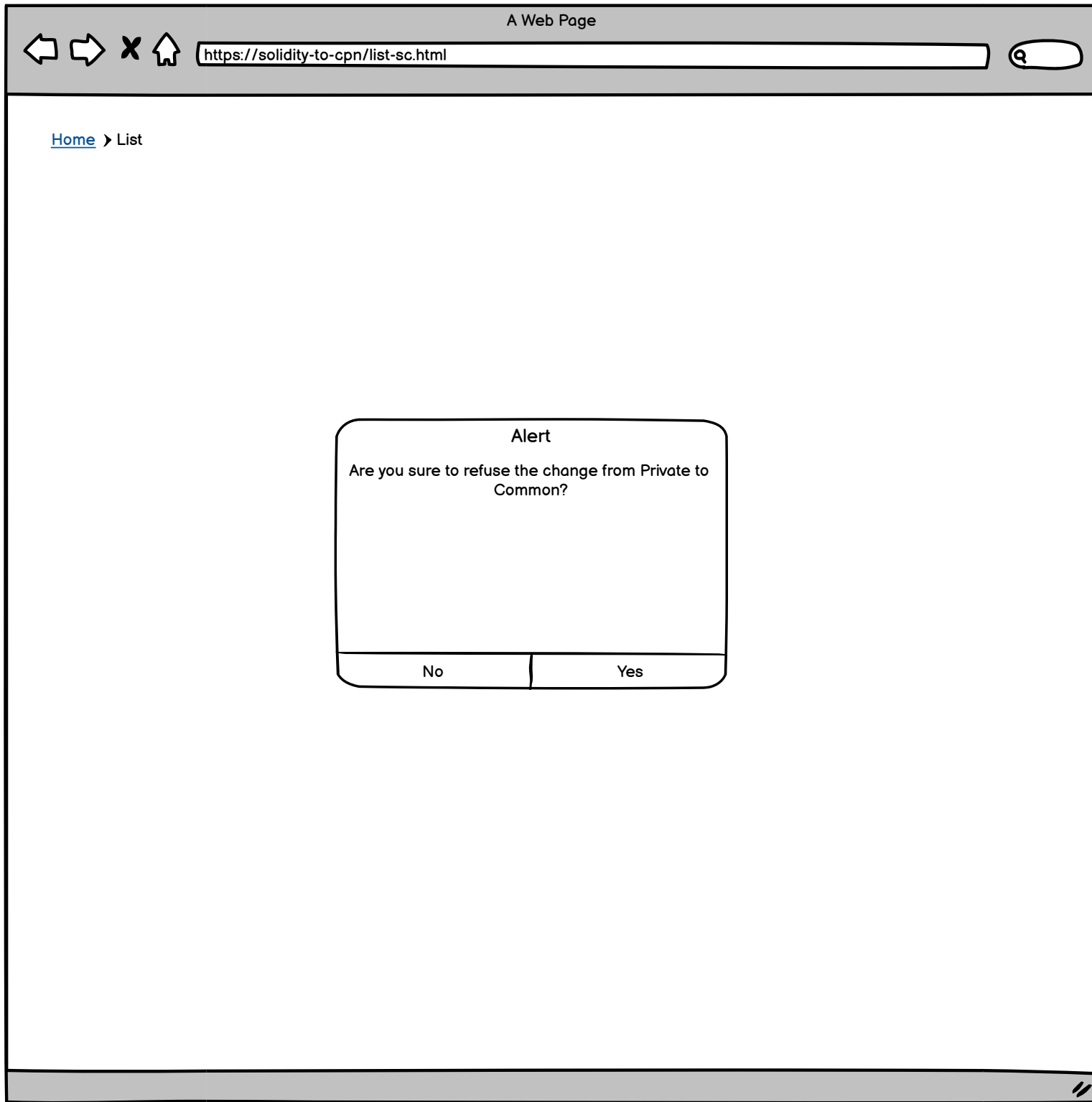
[illegible]

Add

32a



32b



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A Web Page

https://solify-to-cpn/add-sc.html






[Home](#) > Add


Create a new Smart Contract code


Name


Smart Contract Type


- Common
- Private
- Pending

B I U S *style*     









Admin can create a new smart contract type in any types

Edit the Smart Contract code

Name

Smart contract 1

Smart Contract Type

Common

Common

Private

Pending

Content

B I U S style ▼ ≡ ≡ ↺ ↻ 🖼️ 😊

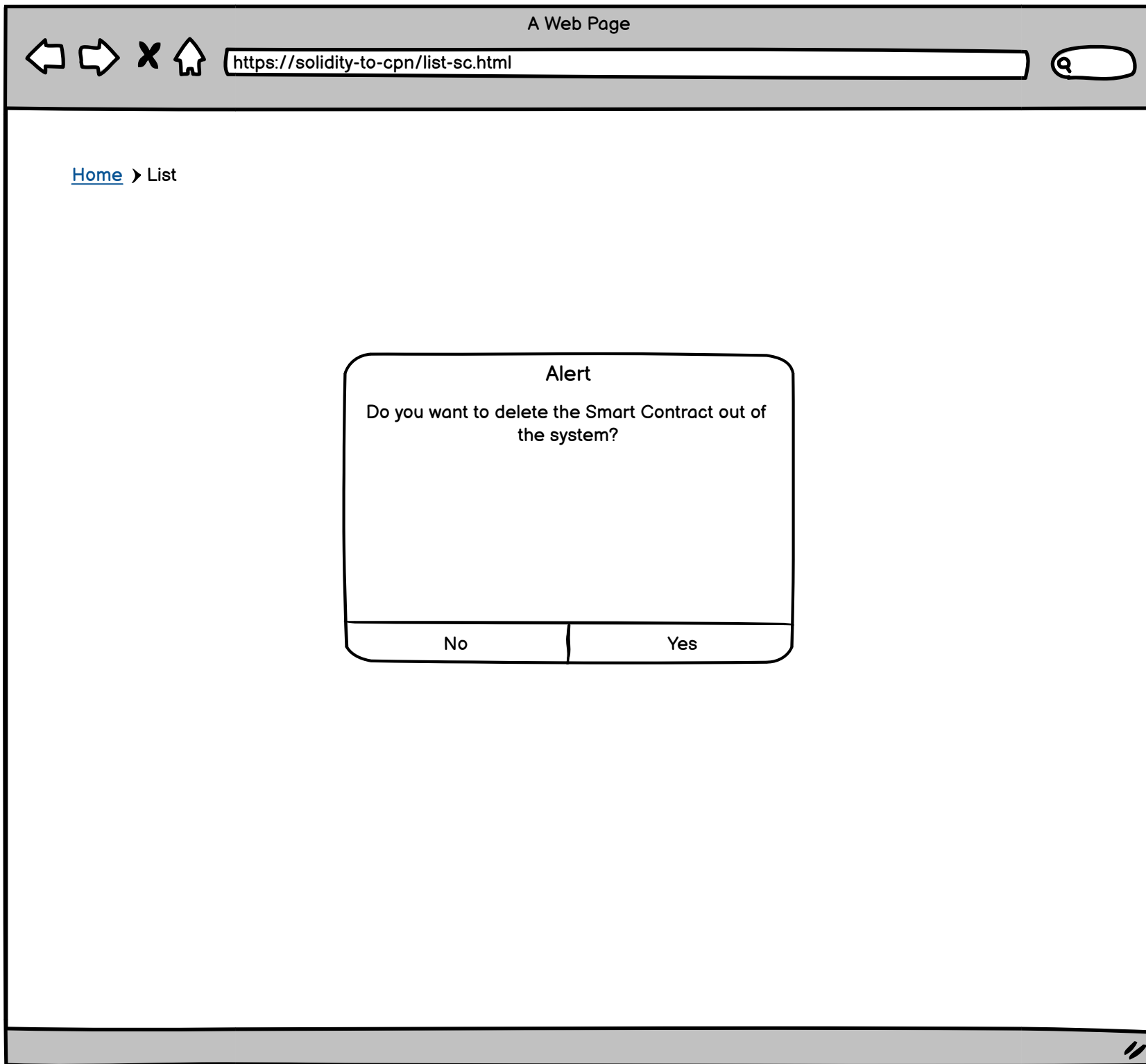
Admin can change the smart contract type from private to common
If user requested to change the SC type from private to common, the type will be Pending

Description

Save

Cancel

32c



The smart contract CRUD page of normal user

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Name

Smart Contract Type

© Private

Content



Cancel

[Home](#) ➤ [Edit](#)

Smart contract 1

© Private

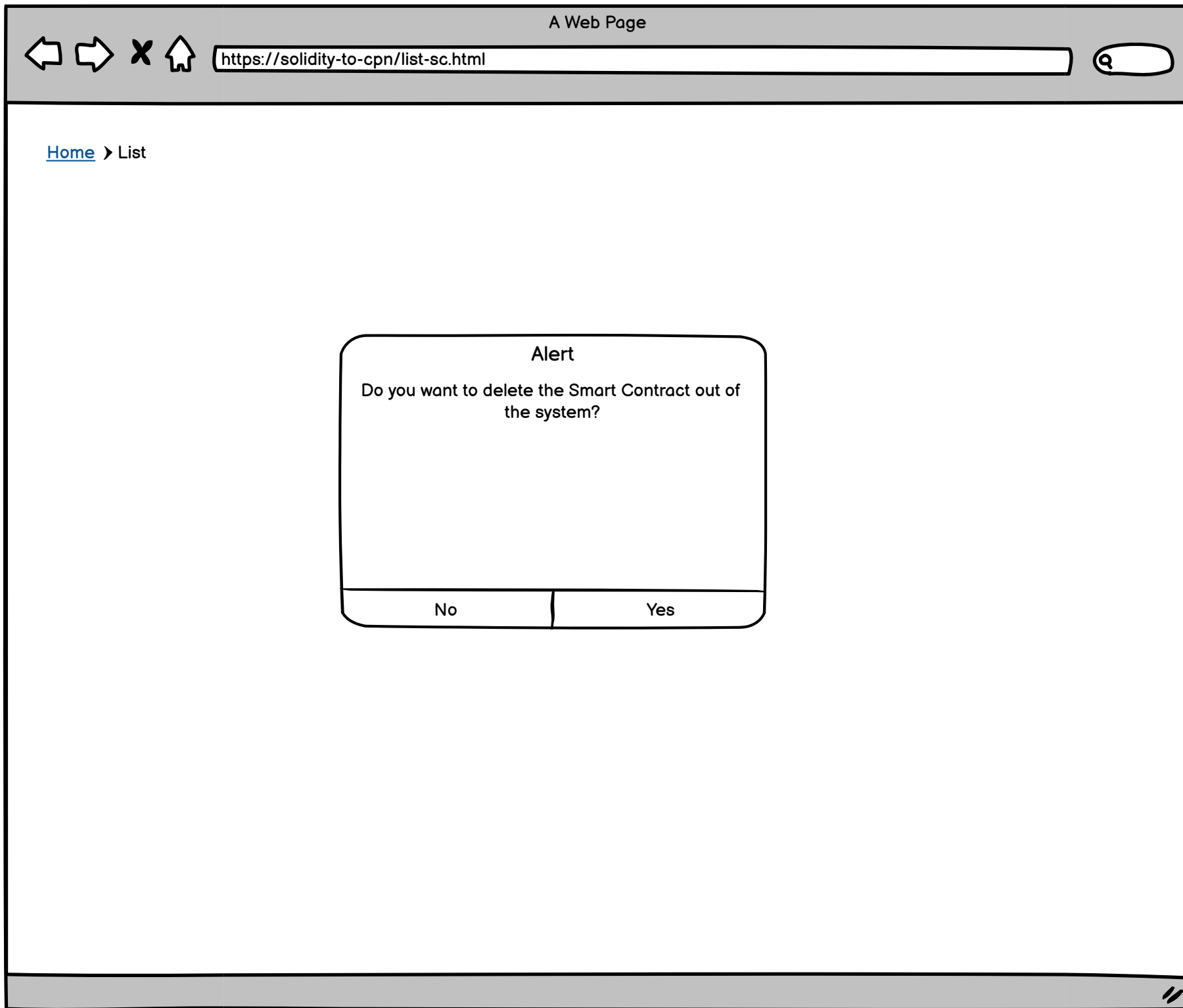
B I U S style ▼ ≡ ≡ ≡ ↺ ↻ 🖼️ 😊

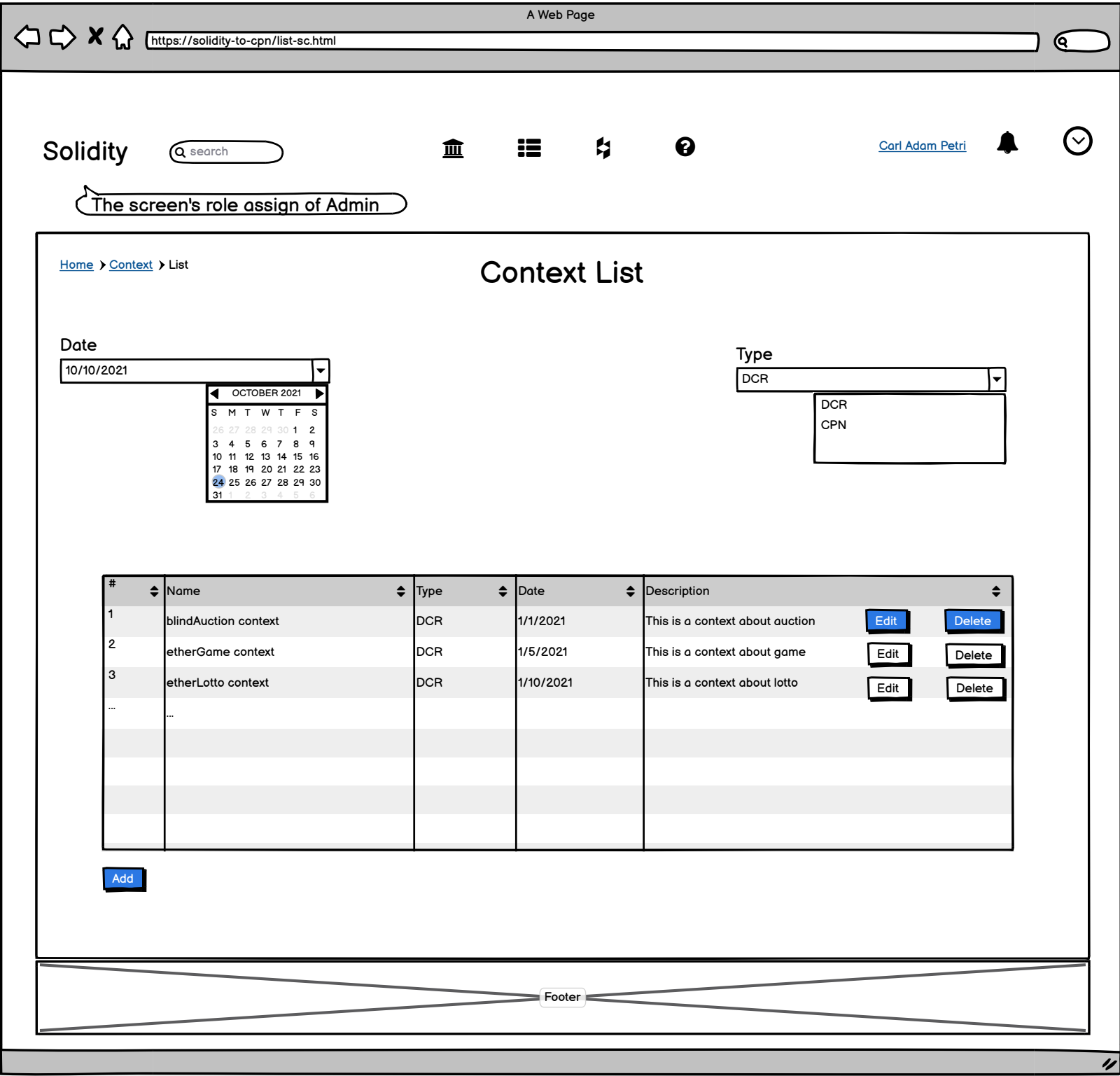
~~XXXXXXXXXXXX~~

~~XXXXXXXXXXXX~~

Cancel

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A Web Page

X

https://solify-to-cpn/add-context.html

Q

[Home](#) > Add

Create a new Context

Name

Context ABC

Type

DCR

DCR

BPMN

Description

Content

C:/abc/xyz/Context.xml

Save

Cancel

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A Web Page

X

https://solify-to-cpn/edit-context.html

Q

[Home](#) > Edit

Update the Context

Name

Context ABC

Type

DCR

DCR

BPMN

Description

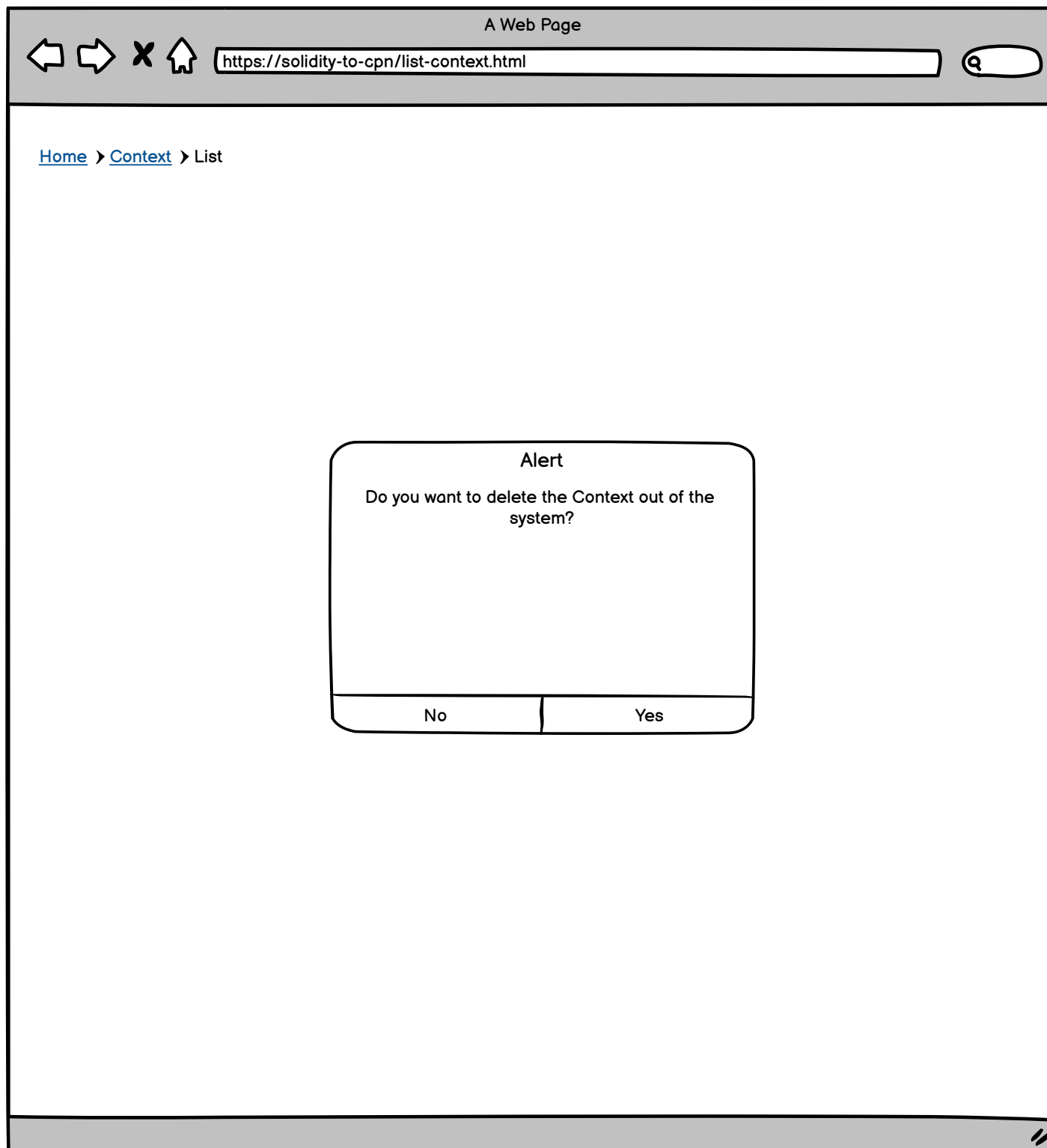
Content

C:/abc/xyz/Context.xml

Save

Cancel

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Create a new LTL Property Template

Livelock

B I U S style ▼ $\frac{1}{2}$ $\frac{2}{3}$ | ↺ ↻ |  😊

~~XXXXXXXXXXXX~~

~~XXXXXXXXXXXX~~

~~XXXXXXXXXXXX~~

[REDACTED]

~~XXXXXXXXXXXX~~

Cancel

[Home](#) ▶ [LTL](#) ▶ Edit

Update the LTL Property Template

Name

Livello

Formula

B *I* U S style ▼ \equiv $\frac{1}{2}$ $\frac{3}{3}$ \equiv | ↺ ↻ |  

Description

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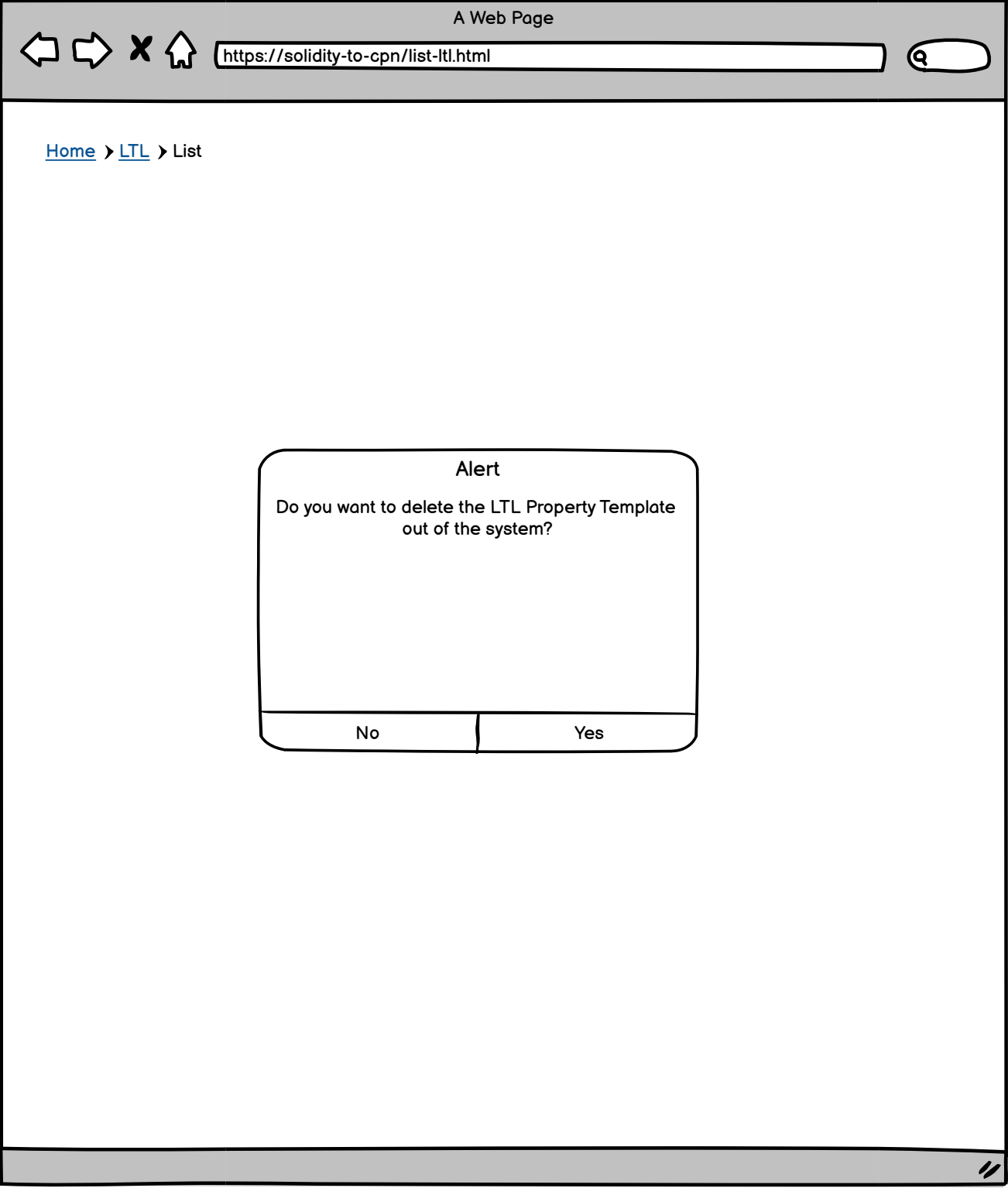
~~XXXXXXXXXXXX~~

~~XXXXXXXXXXXX~~

Save

Cancel

41a



A Web Page

https://solidity-to-cpn/roadmap.html

Home

Roadmap

Roadmap

Starts

Select Smart Contracts

Select Context

Choose Vulnerability

Generate SC to CPN

Check the SCs

Finished

The syntax of the Smart Contract is not correct. You can go back and check the formular before going to the next steps.