



# Programming in Java – Part 08 – Acceptance Tests



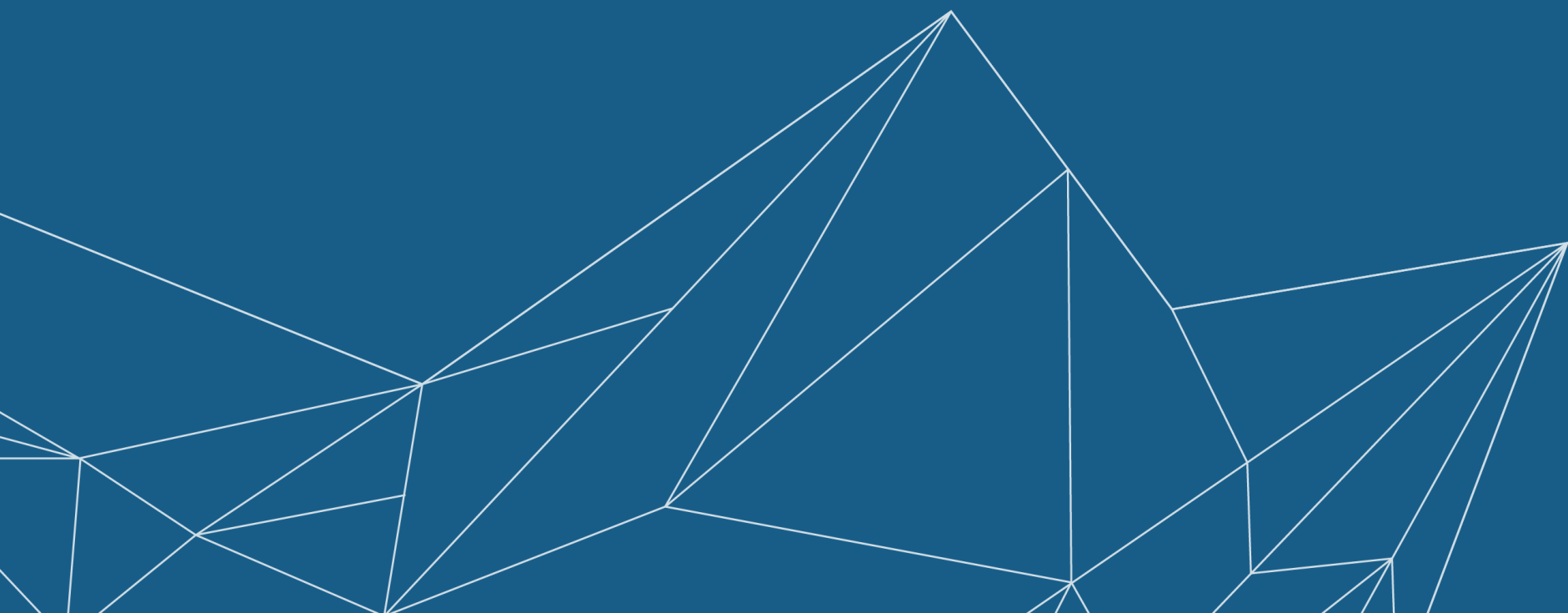
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ESTECO SpA



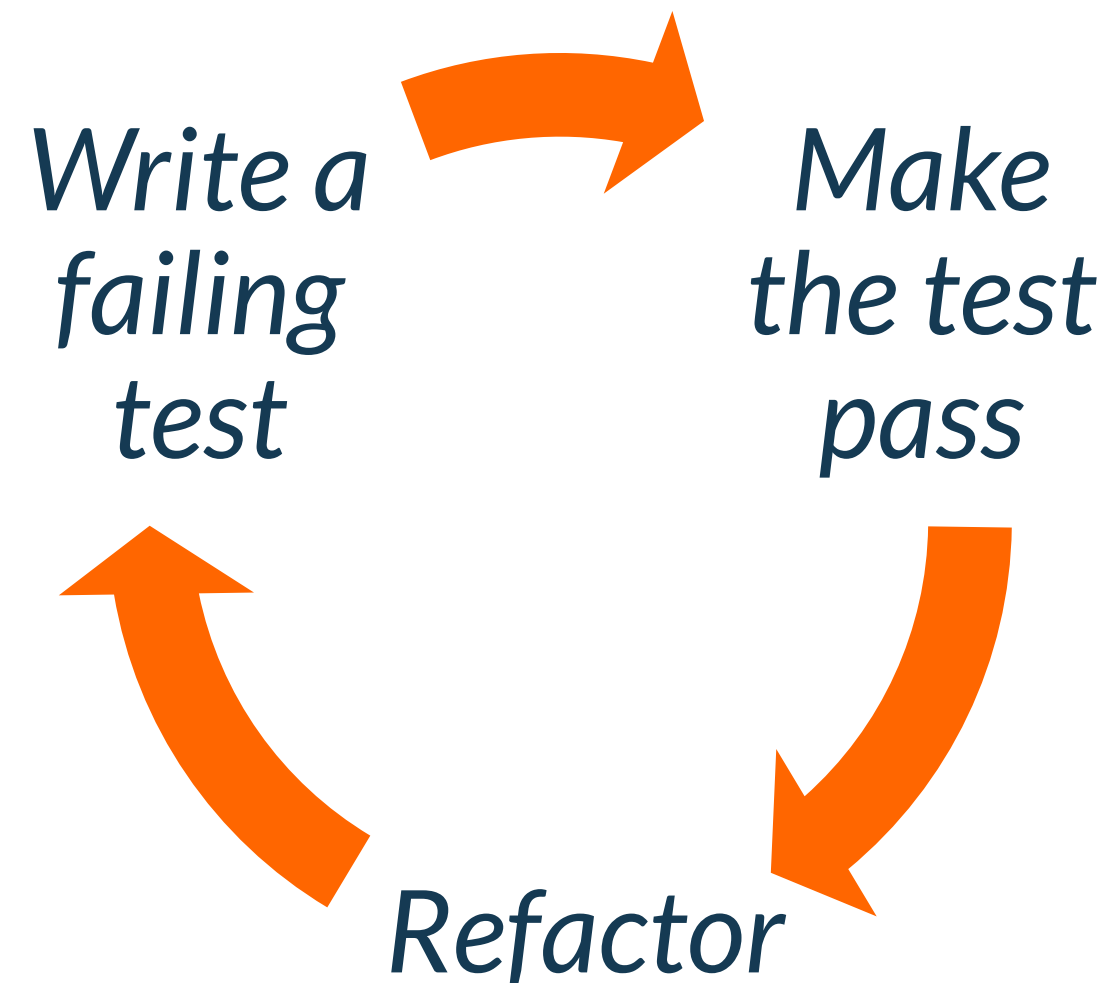
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# Acceptance tests

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# TDD Cycle

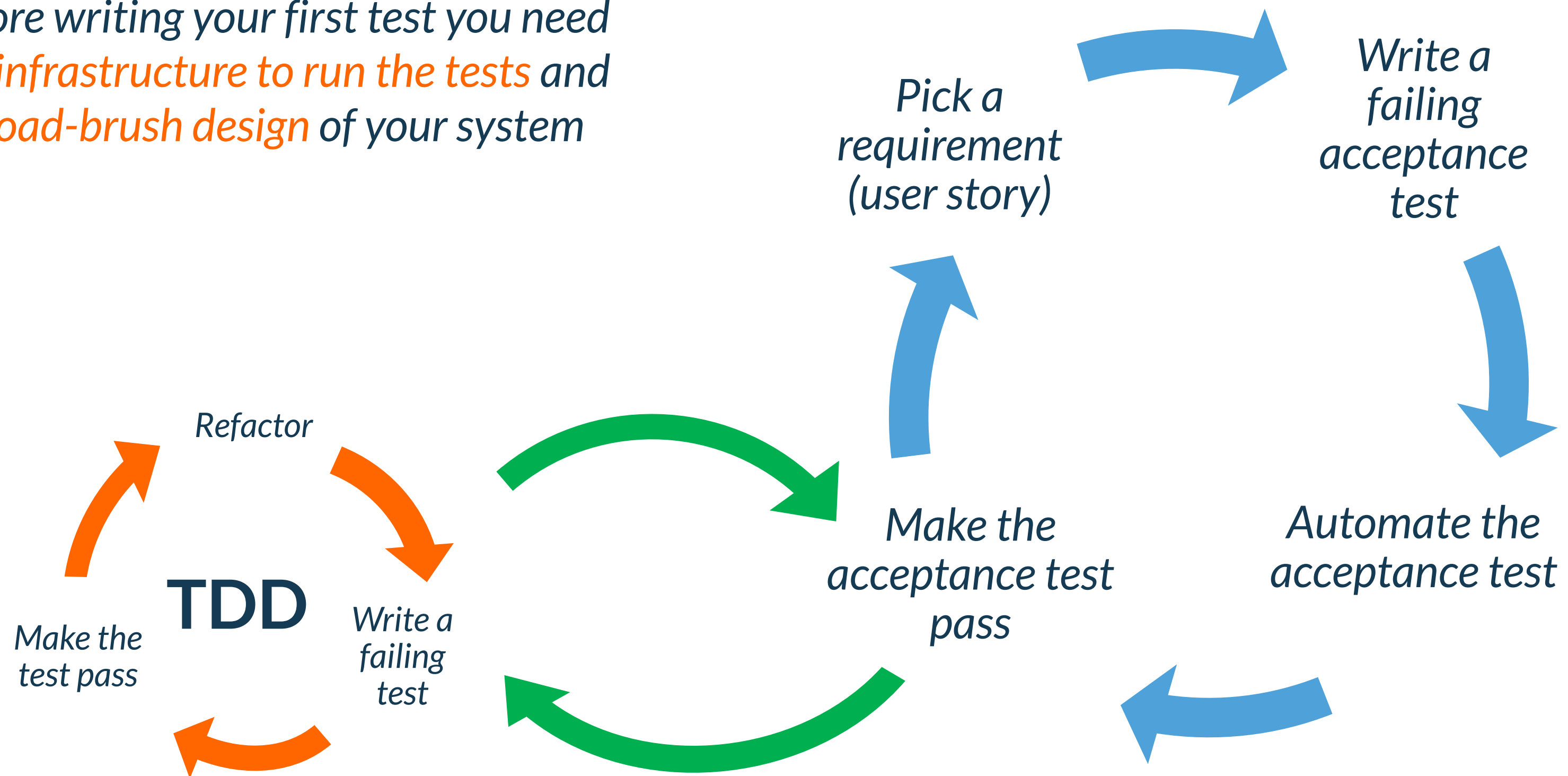


- *System grows by adding tests for the new features into an existing infrastructure*
- *What about the very first feature?*
- *You should start every new feature by writing an acceptance test*
- *An acceptance test should exercise the system end-to-end*
  - *We are making a small exception because we'll not test the GUI*



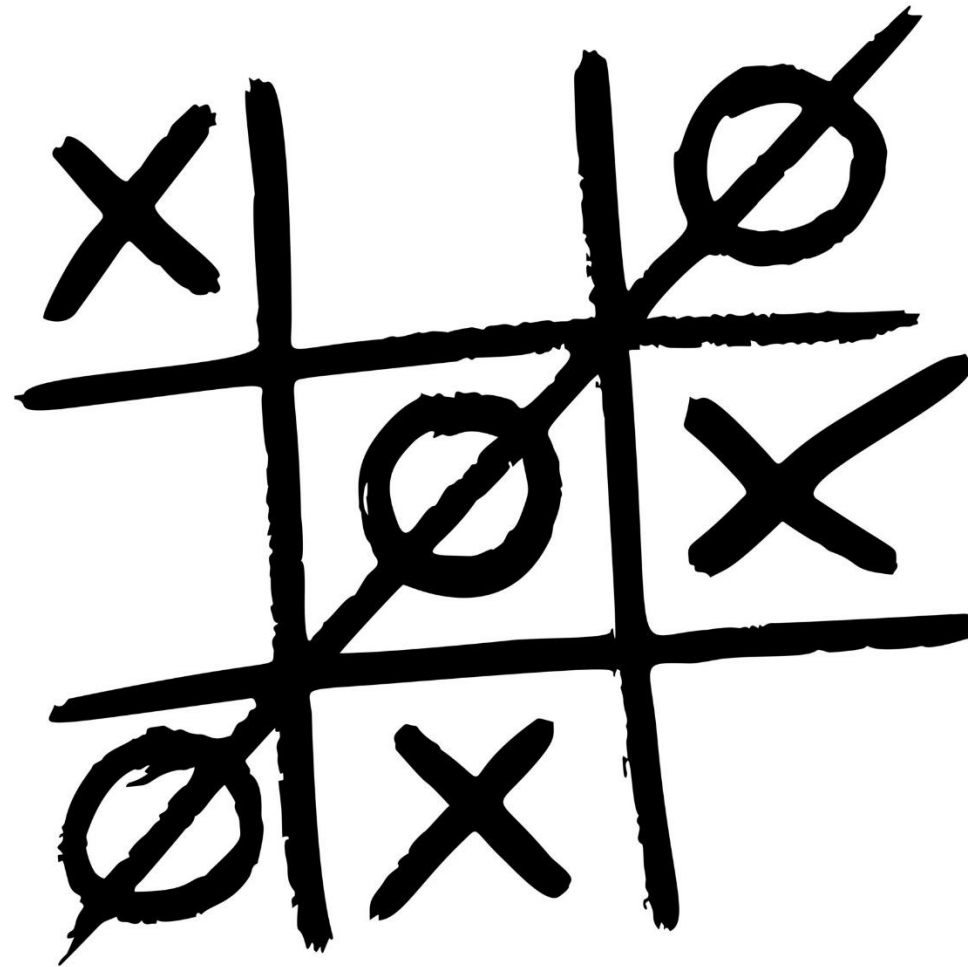
# A proposed process

Before writing your first test you need the *infrastructure to run the tests* and a *broad-brush design* of your system



# Problem

*Develop an application to play tic-tac-toe*



*Where should you begin?*



# Let's start with a test!

- *Which kind of test?*
- *So far, you know **unit tests** only, but you haven't any class*
- *You should write an acceptance test that's closer to the problem statement*
- *Let's start by refining the problem statement into requirements*



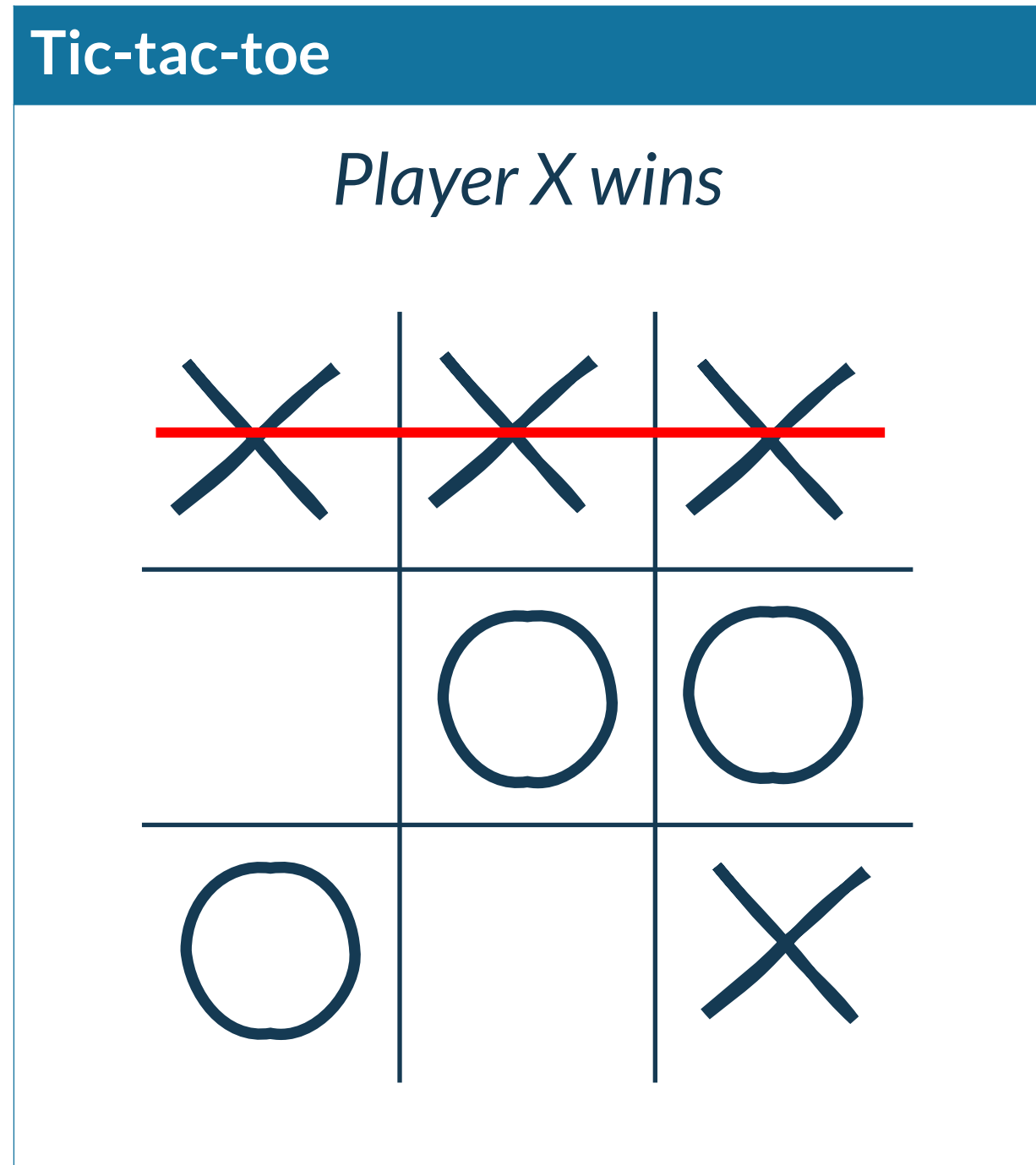
# Refining the problem into requirements

*“Develop an application to play tic-tac-toe”*

- *Two players (O and X) alternatively place their marks on the (3x3) board*
- *When a player places three marks in a row, the player is declared the winner of the game*
- *When the board is full and there is no winner, a draw is declared*
- *Each player places their marks by clicking on a cell of the board*
- *A player should not be allowed to click on cell on which there is already a mark*
- *...*

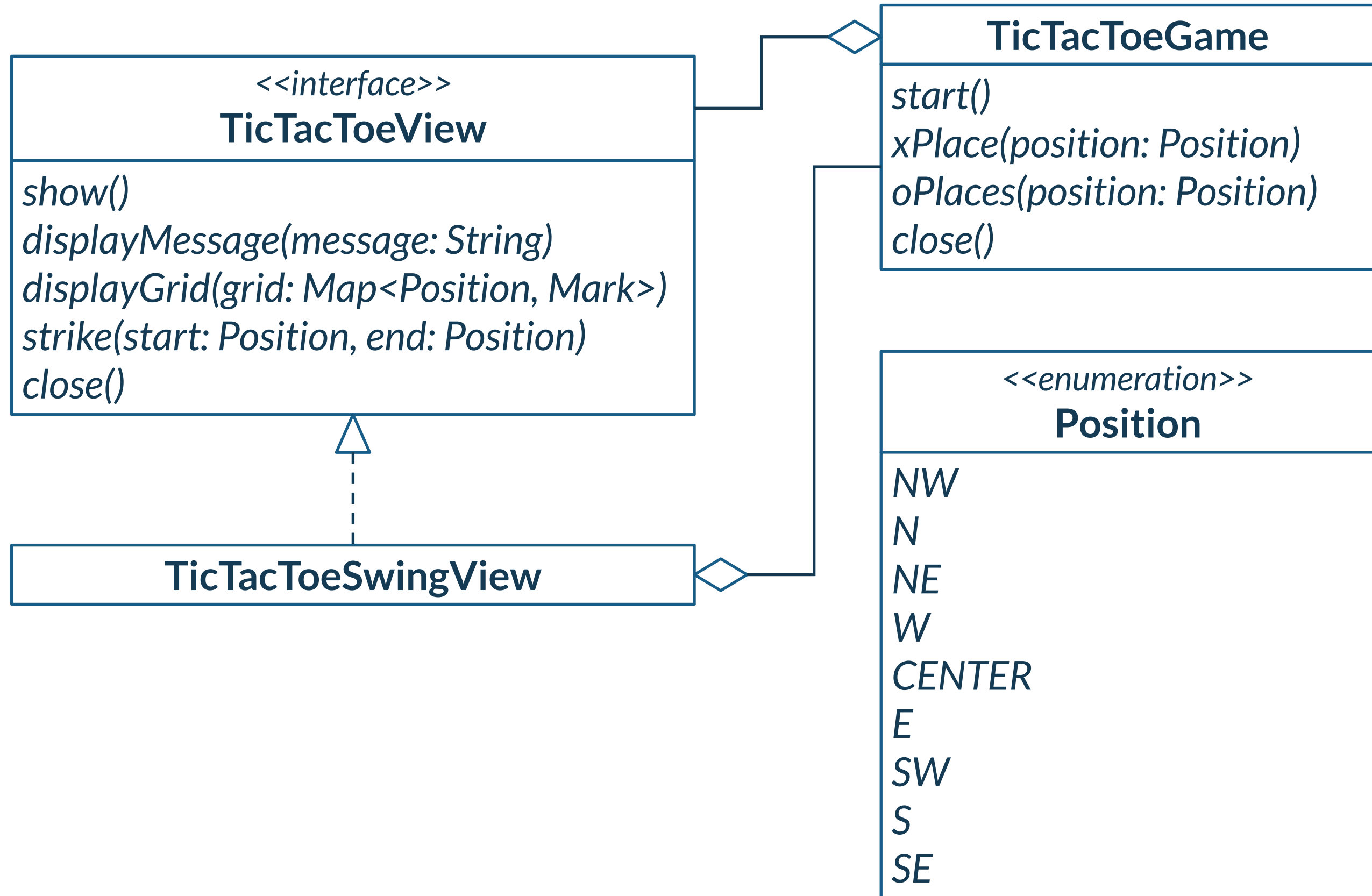
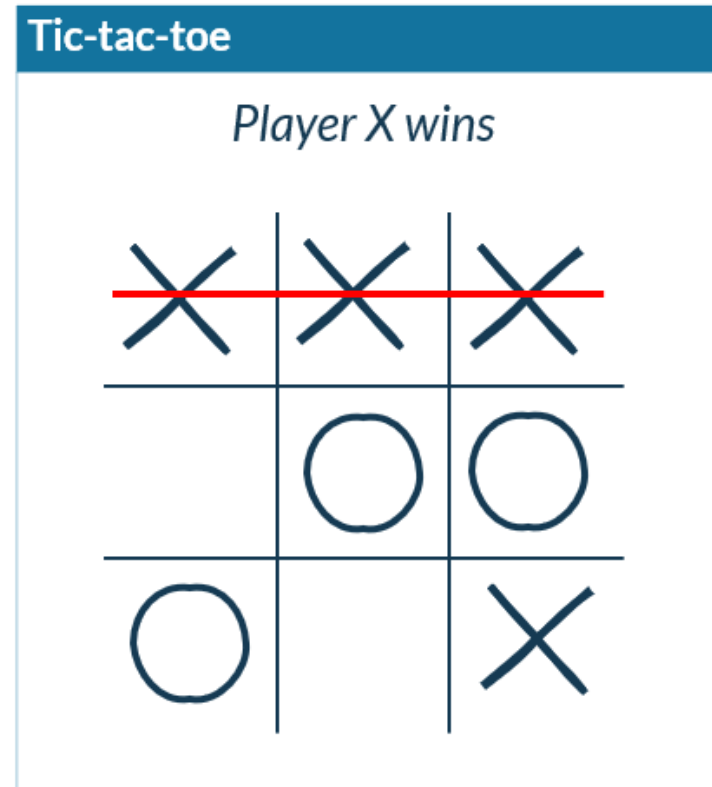


# You can start with a graphic mock-up





# Broad-brush design



## **“When a player places three marks in a row, the player is declared the winner of the game”**

1. *game start → open window, display empty grid, display “Player X is your turn”*
2. *player X places a mark in the North-West cell → display “X” in NW cell, display “Player O is your turn” message*
3. *player O places a mark in the center cell → display “X” in NW cell, display “O” in CENTER cell, display “Player X is your turn”*
4. *player X places a mark in the South-East cell → display “X” in NW and SE, “O” in CENTER, display “Player O is your turn”*
5. *player O places a mark in the South-West cell → display “X” in NW and SE, “O” in CENTER and SW, display “Player X is your turn”*
6. *player X places a mark in the North-East cell → display “X” in NW, SE, and NE, “O” in CENTER and SW, display “Player O is your turn”*
7. *player O places a mark in the East cell → display “X” in NW, SE, and NE, “O” in CENTER, SW, and E, display “Player X is your turn”*
8. *player X places a mark in the North → display “X” in NW, SE, NE, and N, “O” in CENTER, SW, and E, strike from NW to NE, display “Player X won”*
9. *exit → close window*



“When a player places three marks in a row, the player is declared the winner of the game”

Action	Window	Grid	Message									
Start	open	empty	Player X is your turn									
X places a mark in North-West		<table border="1"><tr><td>x</td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>	x									Player O is your turn
x												
O places a mark in Center		<table border="1"><tr><td>x</td><td></td><td></td></tr><tr><td></td><td>o</td><td></td></tr><tr><td></td><td></td><td></td></tr></table>	x				o					Player X is your turn
x												
	o											
X places a mark in South-East		<table border="1"><tr><td>x</td><td></td><td></td></tr><tr><td></td><td>o</td><td></td></tr><tr><td></td><td></td><td>x</td></tr></table>	x				o				x	Player O is your turn
x												
	o											
		x										
O places a mark in South-West		<table border="1"><tr><td>x</td><td></td><td></td></tr><tr><td></td><td>o</td><td></td></tr><tr><td>o</td><td></td><td>x</td></tr></table>	x				o		o		x	Player X is your turn
x												
	o											
o		x										
X places a mark in the North-East		<table border="1"><tr><td>x</td><td></td><td>x</td></tr><tr><td></td><td>o</td><td></td></tr><tr><td>o</td><td></td><td>x</td></tr></table>	x		x		o		o		x	Player O is your turn
x		x										
	o											
o		x										
O places a mark in the East		<table border="1"><tr><td>x</td><td></td><td>x</td></tr><tr><td></td><td>o</td><td>o</td></tr><tr><td>o</td><td></td><td>x</td></tr></table>	x		x		o	o	o		x	Player X is your turn
x		x										
	o	o										
o		x										
X places a mark in North		<table border="1"><tr><td><del>x</del></td><td><del>x</del></td><td><del>x</del></td></tr><tr><td>o</td><td>o</td><td></td></tr><tr><td>x</td><td></td><td>o</td></tr></table>	<del>x</del>	<del>x</del>	<del>x</del>	o	o		x		o	Player X wins
<del>x</del>	<del>x</del>	<del>x</del>										
o	o											
x		o										
Exit	close											

An executable specification <-> acceptance test



# Demo



# And now?

*Acceptance tests are at a higher level than unit tests, they are closer to the requirements*

**Unit tests** *assure we are building the system in the right way*

**Acceptance tests** *assure we are building the right system*

*Unit tests and acceptance tests are not exclusive they are complementary*

*Shall you write more acceptance tests or unit tests?*



# To know more

- *Specification by Example*

<https://less.works/less/technical-excellence/specification-by-example>

*Focus on ATTD as collaborative requirements discovery approach*





Thank you!

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