Interface Segregation Principle (ISP)

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Clients should not be forced to depend on methods that they do not use.

1

Introduction by Example

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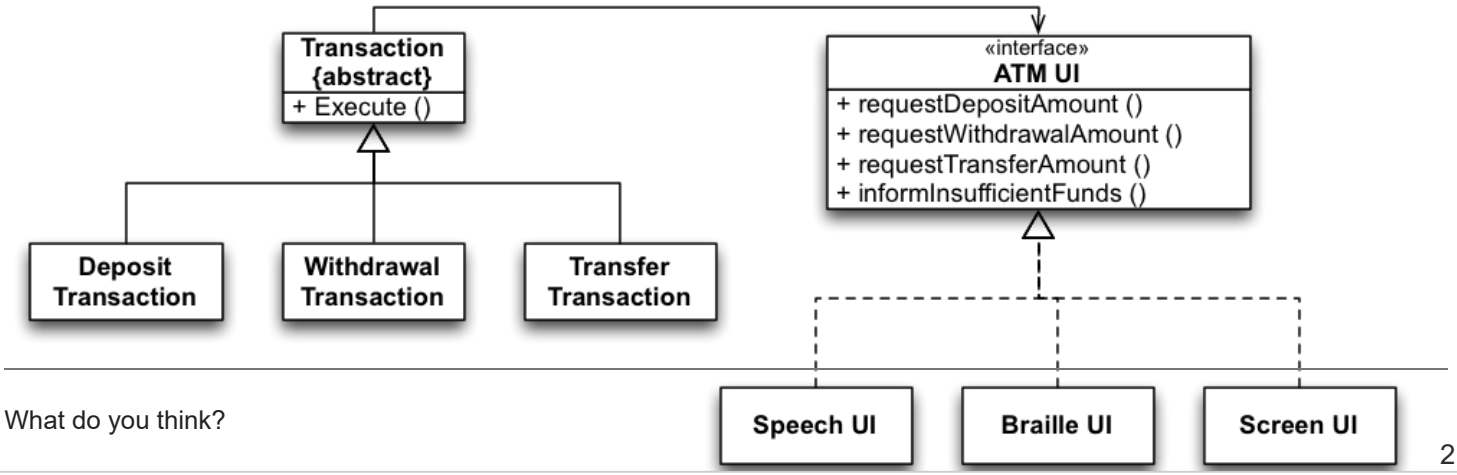
Consider the development of software for an automatic teller machine (ATM):

- Support for the following types of transactions is required: withdraw, deposit, and transfer
- Support for different languages and support for different kinds of UIs is also required
- Each transaction class needs to call methods on the GUI
  E.g., to ask for the amount to deposit, withdraw, transfer.



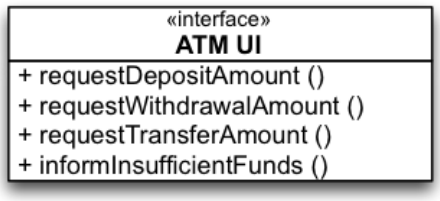
What do you think?

2

Assessment:

ISP tells us to avoid this. Each transaction class uses a part of the interface, but depends on all others. Any change affects all transactions.

A Polluted Interface



`ATM UI` is a polluted interface:

- It declares methods that do not belong together.
- It forces classes to depend on unused methods and therefore depend on changes that should not affect them.
- ISP states that such interfaces should be split.

3

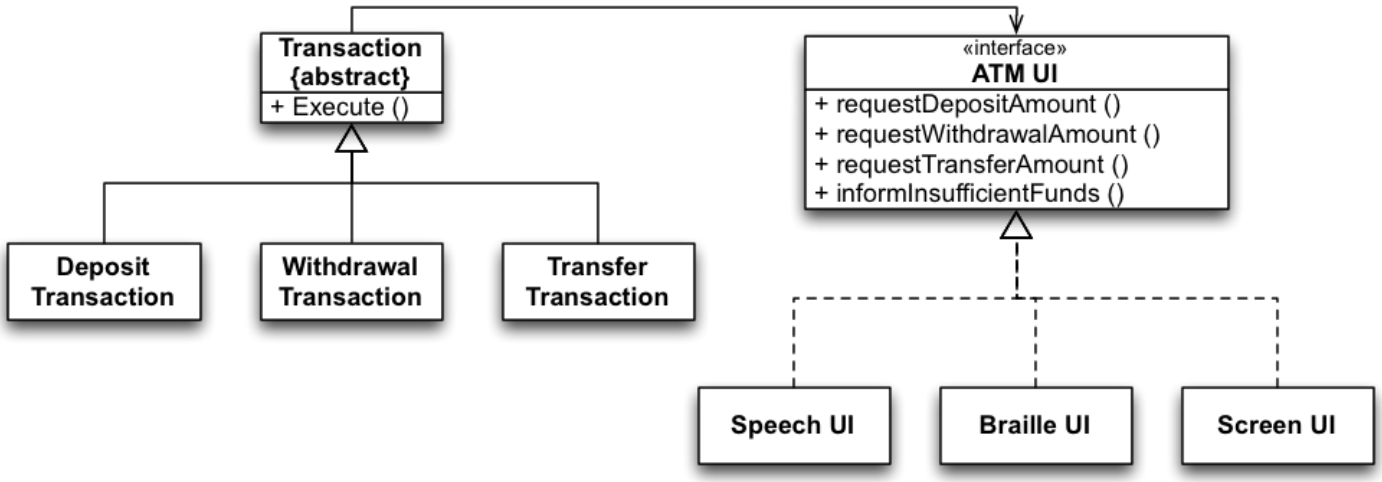
The Rationale Behind ISP

> When clients depend on methods they do not use, they become subject to changes forced upon these methods by other clients.

This causes coupling between all clients.

4

How does an ISP compliant solution look like?



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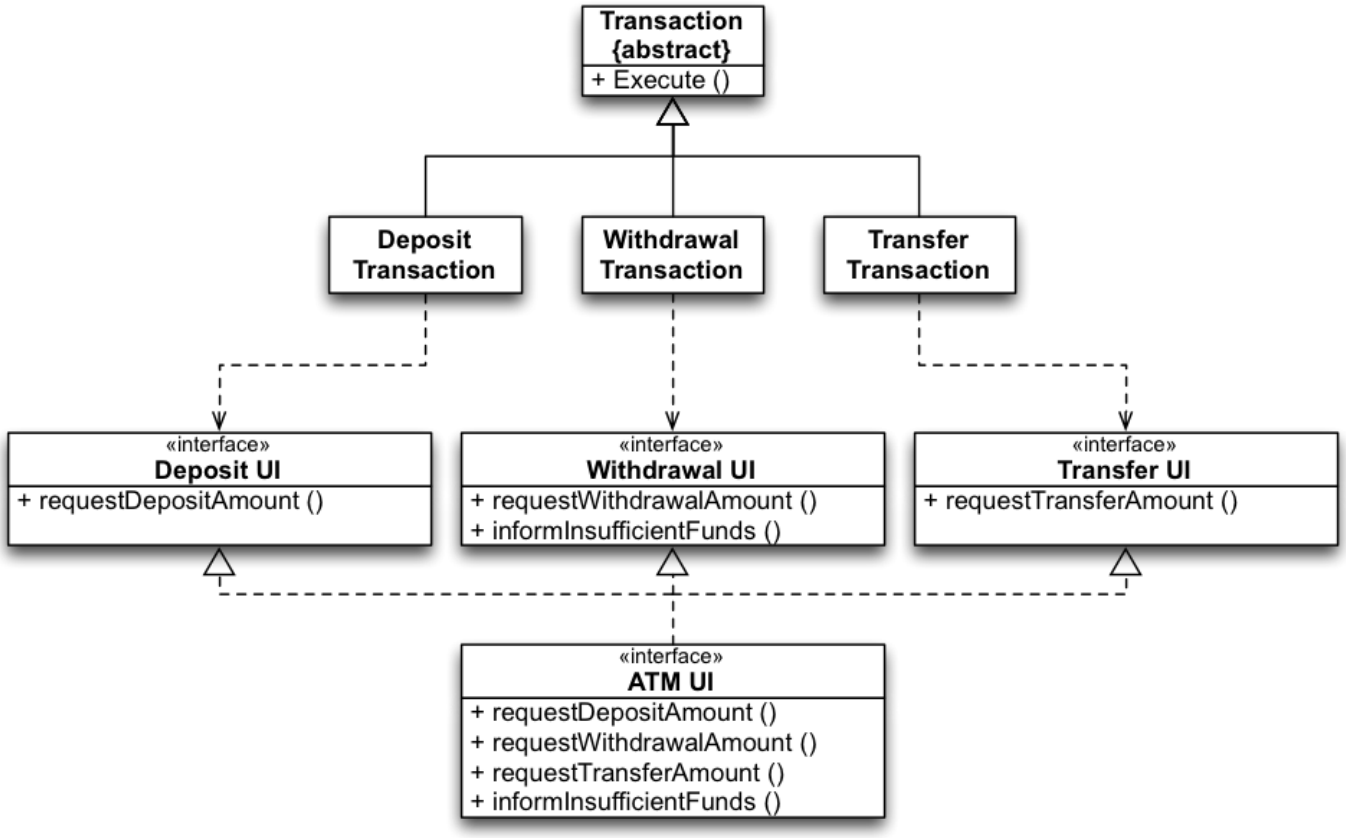
An ISP Compliant Solution



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Proliferation of Interfaces

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Try to group possible clients of a class and have an interface for each group.

But: Segregating interfaces should not be overdone!

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If you overdue the application of the interface segregation principle, you will end up with 2n-1 interfaces for a class with n methods.

Recall that, in general, a class implementing many interfaces may be a sign of a violation of the single-responsibility principle.

Takeaway

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