State

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- behavioral design pattern that lets an object alter its behavior when its internal state changes
- a lot of applications have object that realizes some "logic states" (aka Finite State Machine)
- "orders", "machines", "buttons", car (engine), invoice, employee - we are living in a stateful world

```
public void InsertCard()
{
   switch (_currentState)
   {
      case MACHINE_STATE.INITIAL:
         _currentState = MACHINE_STATE.CARD_INSERTED;
         break;
      case MACHINE_STATE.CARD_INSERTED:
      case MACHINE_STATE.PIN_ENTERED:
      case MACHINE_STATE.CASH_WITHDRAWN:
         throw new InvalidOperationException("Card already inserted");
      default:
         throw new ArgumentOutOfRangeException();
   }
}
public void EnterPin(Pin pin)
{
   switch (_currentState)
   {
      case MACHINE_STATE.INITIAL:
         throw new InvalidOperationException("No card inserted");
      case MACHINE_STATE.CARD_INSERTED:
         if (pin != 1234) throw new InvalidOperationException("incorect pin");
         _currentState = MACHINE_STATE.PIN_ENTERED;
         break;
      case MACHINE_STATE.PIN_ENTERED:
      case MACHINE_STATE.CASH_WITHDRAWN:
         throw new InvalidOperationException("Pin already entered");
      default:
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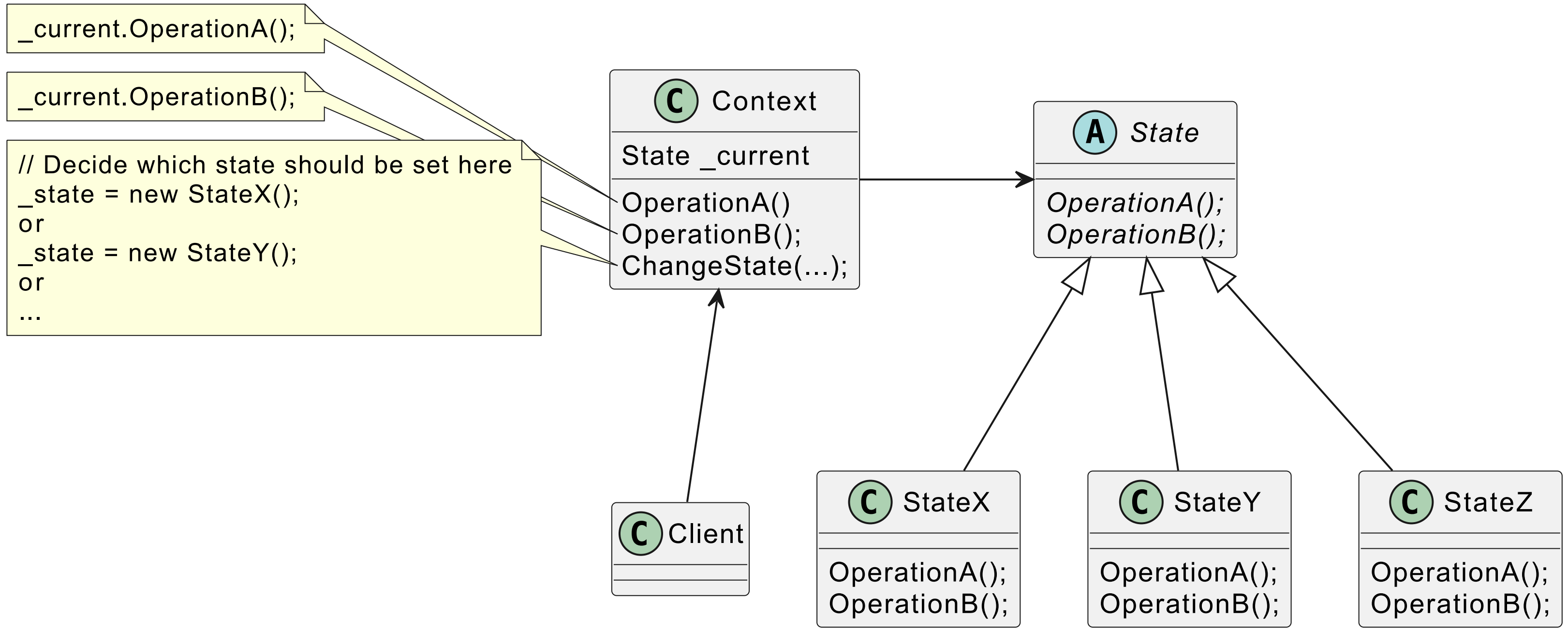

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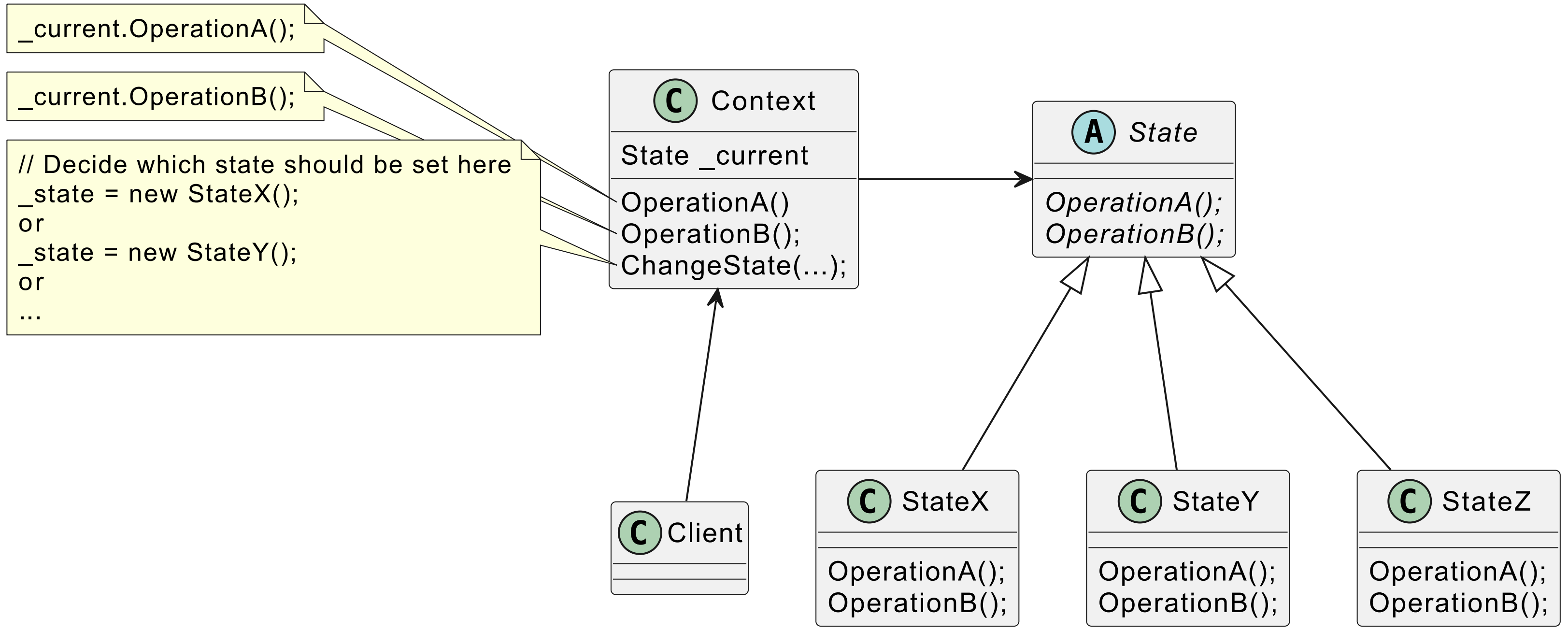

- context - interface for clients, facade for operations, holds state
- who changes "state" - context or specific state?
- states created *ad-hoc* or at once (or maybe from a pool?).

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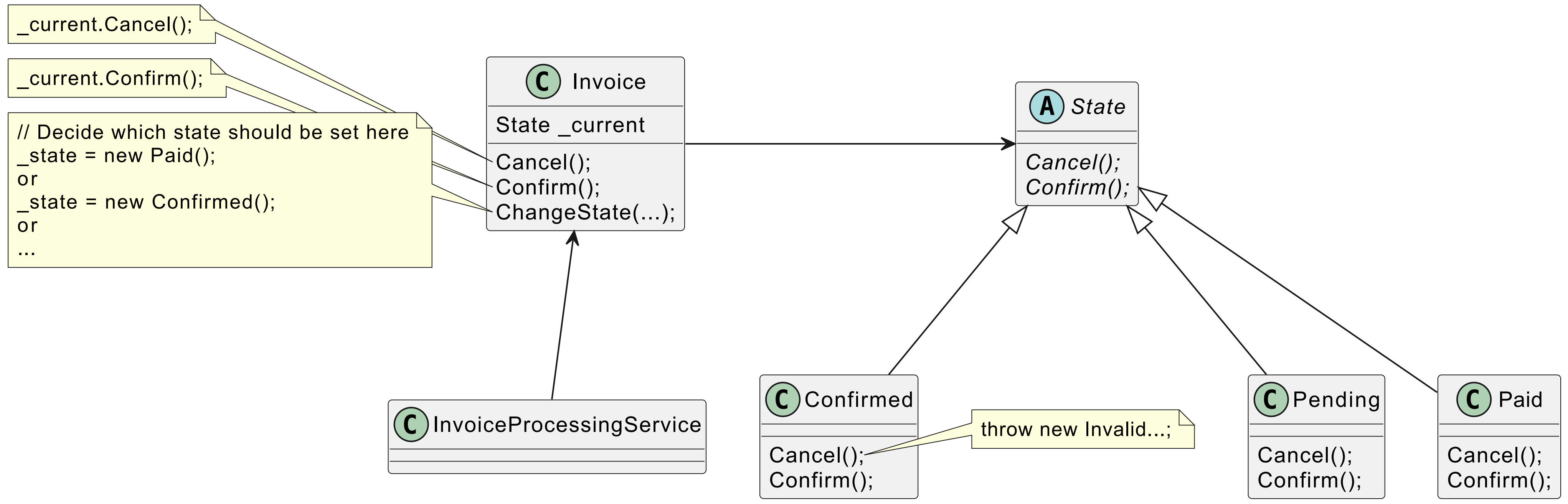

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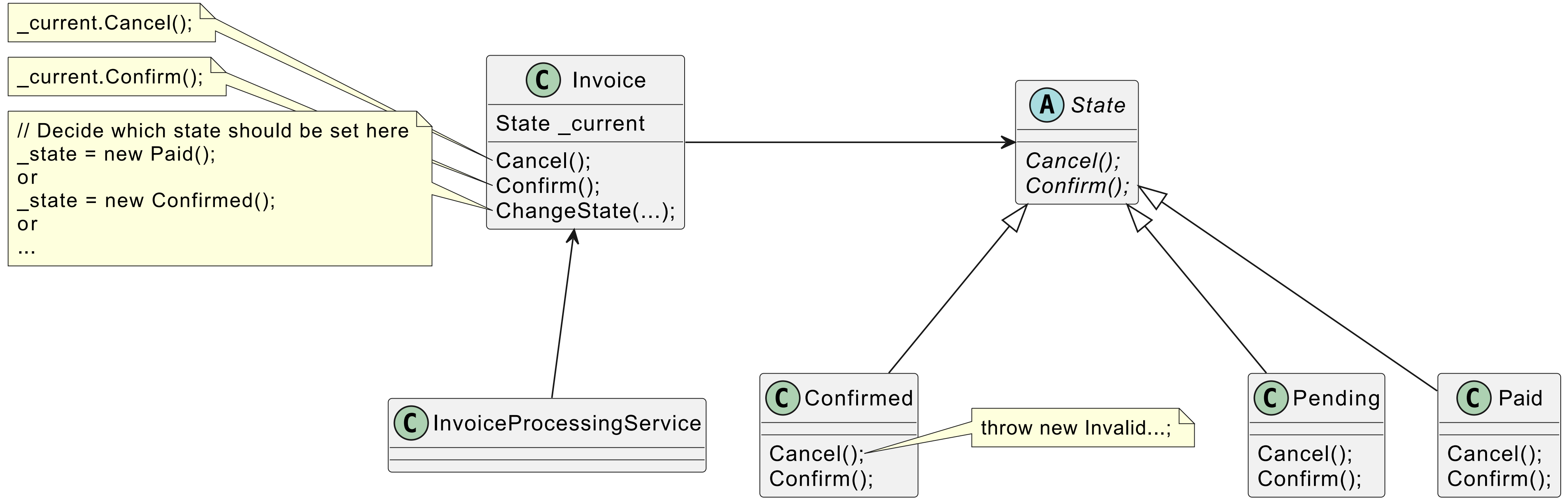

- context (**`Invoice`**) - interface for client (**`InvoiceProcessingService`**), facade for operations, holds state
- who changes "state" - probably **`InvoiceProcessingService`**

State - who changes "state"

- transitions rather fixed and unchanging - in context.
- transitions rather flexible - in specific states

State

- use when:
  - you have an object that behaves differently depending on its current state
  - the number of states is **big**
  - and/or the state-specific code **changes** frequently

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- who implements **`changeState`** logic/validation?
  - "centralized" version - our big swtich
  - "decentralized" version - *concrete state* objects:

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Ogólnie: stany mogą być statyczne/singletony (jeśli nie mają danych) i tylko operować na kontekście jako argumencie