



Hlynur Jóhannsson

Yfirhönnuður hugbúnaðar

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**VALITOR**

# Er þetta ekki bara SOLID?



**Scott Hanselman** ✓  
@shanselman

 Follow

BREAKING: Computers, made by humans, contain "software," also by humans. This "Software" has bugs and can be unreliable. More soon.

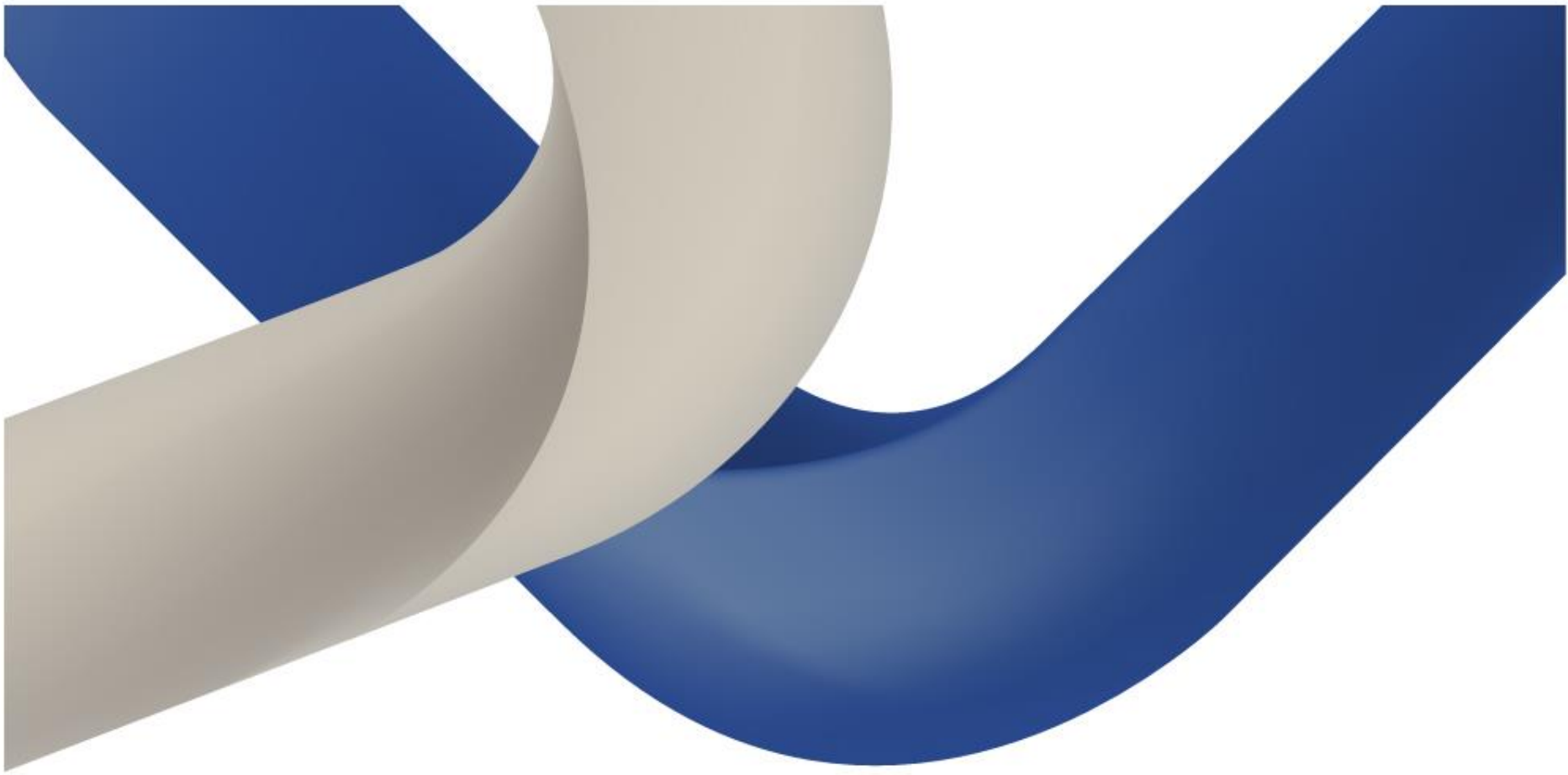
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11:07 PM - 24 Sep 2014



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# SOLID Principles

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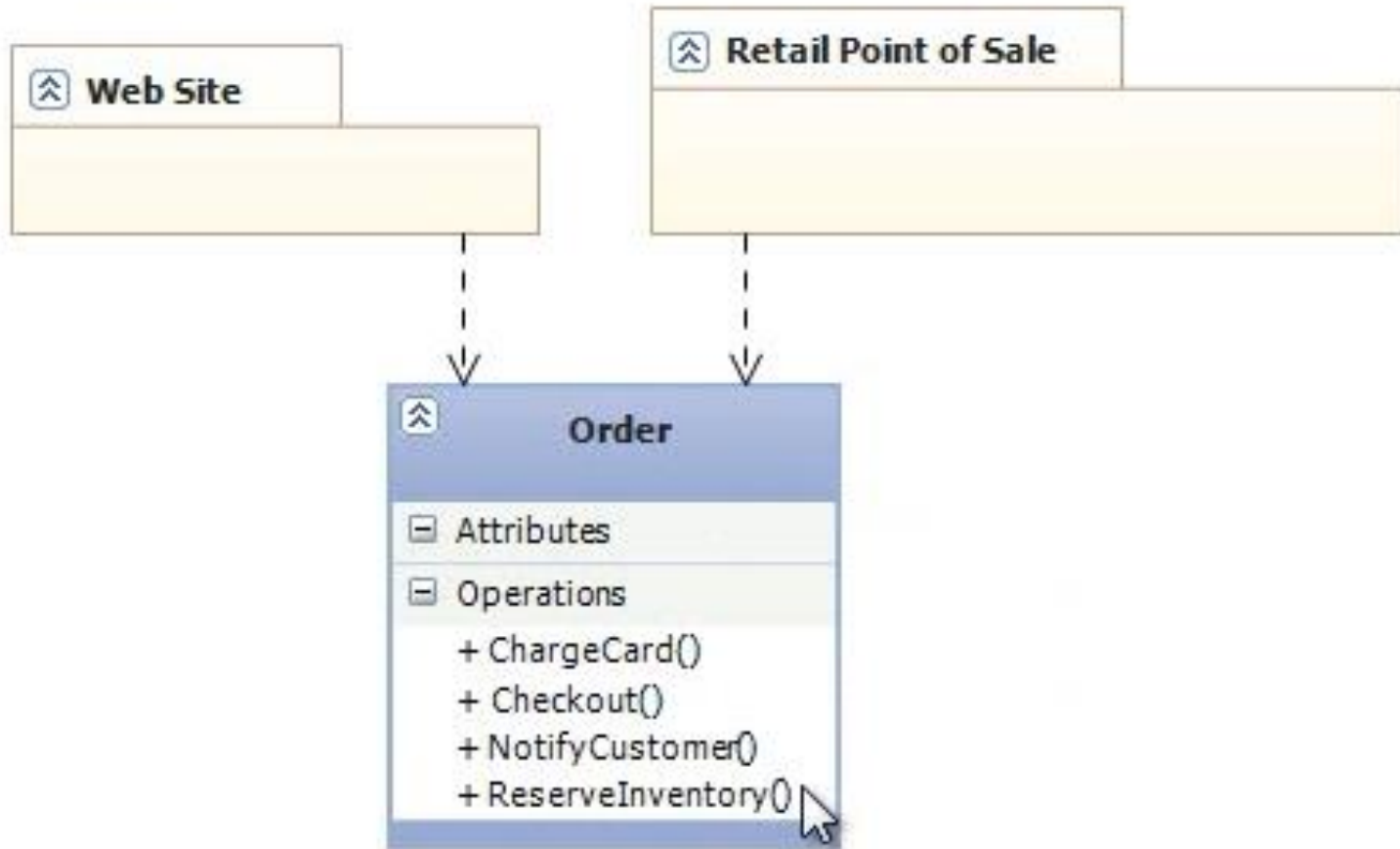
# Single Responsibility Principle



**SINGLE RESPONSIBILITY PRINCIPLE**

Just Because You Can, Doesn't Mean You Should

# Hönnun sem fylgir ekki SRP

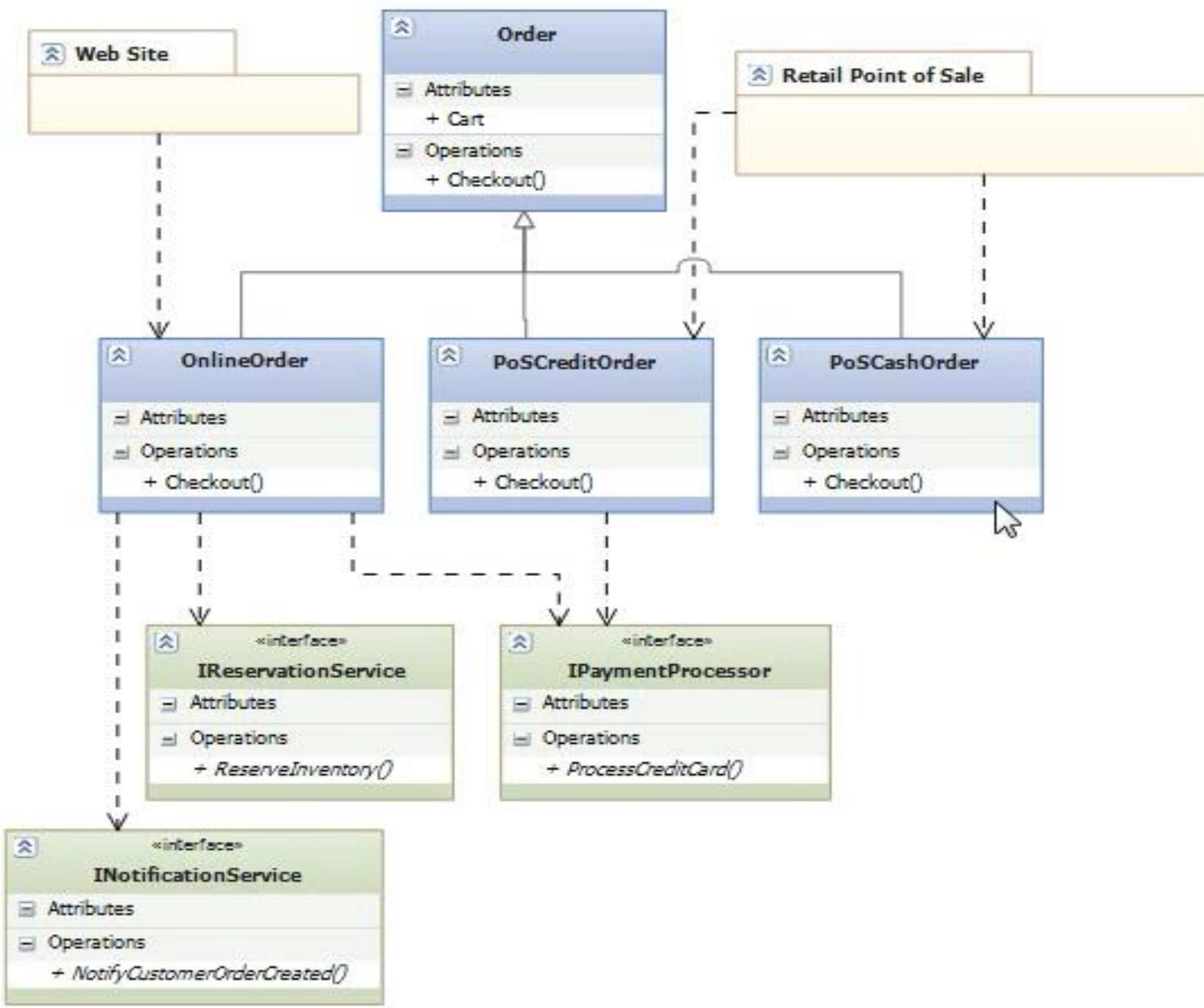


# Hönnun sem fylgir ekki SRP

```
public void Checkout(Cart cart, PaymentDetails paymentDetails, bool notifyCustomer)
{
    if (paymentDetails.PaymentMethod == PaymentMethod.CreditCard)
    {
        ChargeCard(paymentDetails, cart);
    }

    if (paymentDetails.IsECommerce)
    {
        ReserveInventory(cart);
    }

    if(notifyCustomer)
    {
        NotifyCustomer(cart);
    }
}
```



# Hönnun sem fylgir SRP

- Vefviðskipti:

```
public override void Checkout()
{
    paymentProcessor.ProcessCreditCard(paymentDetails, Cart.TotalAmount);

    reservationService.ReserveInventory(Cart.Items);

    notificationService.NotifyCustomerOrderCreated(Cart);
}
```



# SRP notað rétt

- POS með greiðslukorti:

```
public override void Checkout()  
{  
    paymentProcessor.ProcessCreditCard(paymentDetails, Cart.TotalAmount);  
}
```

# Open/Closed Principle



Mynd Derick Bailey, <http://lostechies.com/derickbailey/2009/02/11/solid-development-principles-in-motivational-pictures>

VALITOR

# Hönnun sem fylgir ekki OCP

```
foreach (var orderItem in items)
{
    if (orderItem.StockKeepingUnit.StartsWith("EACH"))
    {
        total += orderItem.Quantity * 5m;
    }
    else if (orderItem.StockKeepingUnit.StartsWith("WEIGHT"))
    {
        total += orderItem.Quantity * 4m/1000;
    }
    else if (orderItem.StockKeepingUnit.StartsWith("SPECIAL"))
    {
        total += orderItem.Quantity * 0.4m;
        var setsOfThree = orderItem.Quantity / 3;
        total -= setsOfThree * 0.2m;
    }
}
```

# Hönnun sem fylgir OCP

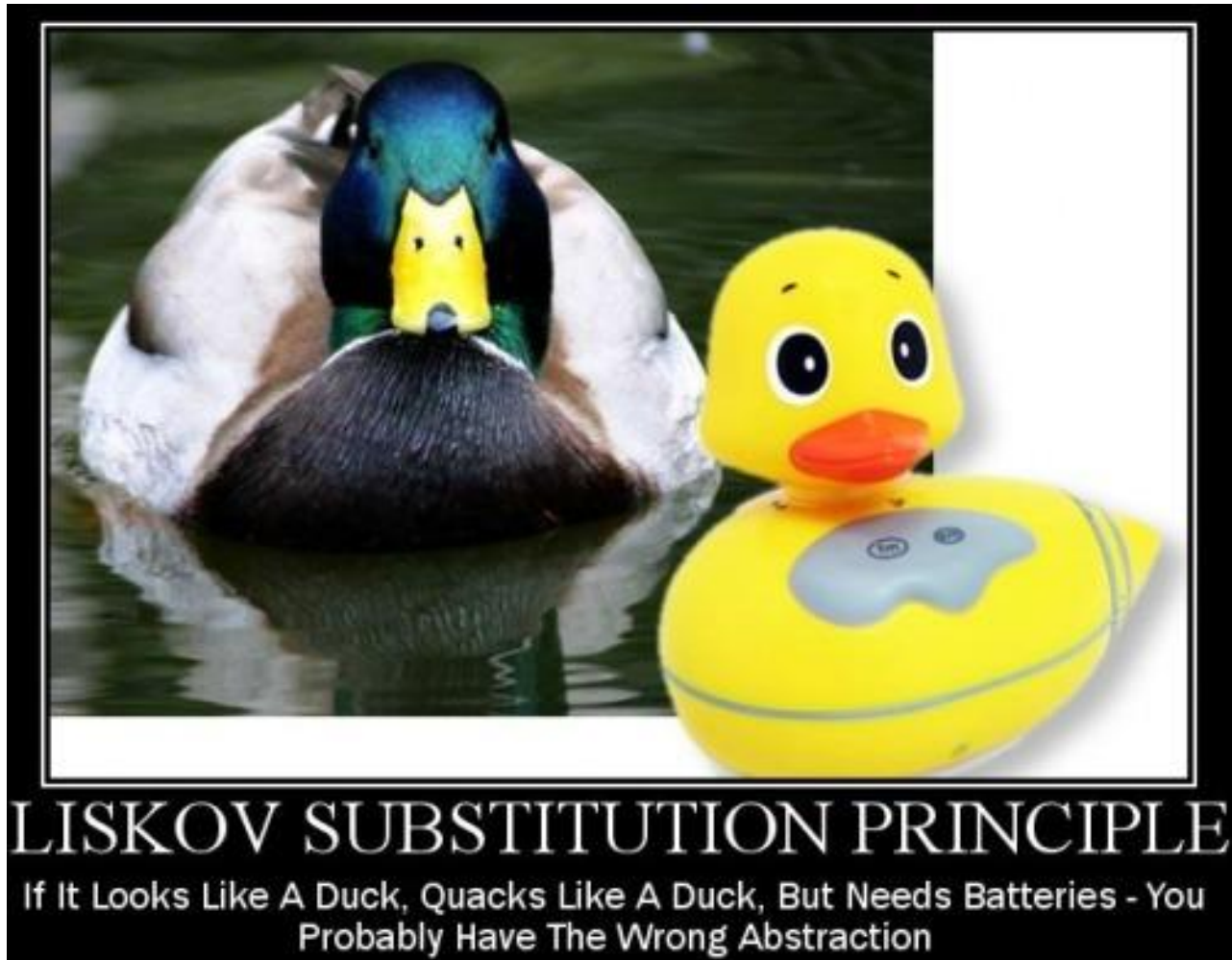
```
public class PerGramPriceRule : IPriceRule
{
    public bool IsMatch(OrderItem item)
    {
        return item.StockKeepingUnit.StartsWith("WEIGHT");
    }

    public decimal CalculatePrice(OrderItem item)
    {
        return item.Quantity * 4m/1000;
    }
}
```

# Hönnun sem fylgir OCP

```
foreach (var item in Items)
{
    total += pricingCalculator.CalculatePrice(item);
}
```

# Liskov Substitution Principle



# Hönnun sem fylgir ekki LSP

```
public class Rectangle
{
    public virtual int Height { get; set; }
    public virtual int Width { get; set; }
}
```

# Hönnun sem fylgir ekki LSP

```
public class Square : Rectangle
{
    private int height;
    private int width;

    public override int Width
    {
        get { return width; }
        set
        {
            width = value;
            height = value;
        }
    }
}
```



# Hönnun sem fylgir ekki LSP

```
Rectangle newRectangle = new Square();  
newRectangle.Width = 4;  
newRectangle.Height = 5;  
Assert.AreEqual(20, AreaCalculator.CalculateArea(newRectangle));
```

# Hönnun sem fylgir LSP

```
public abstract class Shape
{
    public abstract int Area();
}
```

# Hönnun sem fylgir LSP

```
public class Rectangle : Shape
{
    public virtual int Height { get; set; }
    public virtual int Width { get; set; }

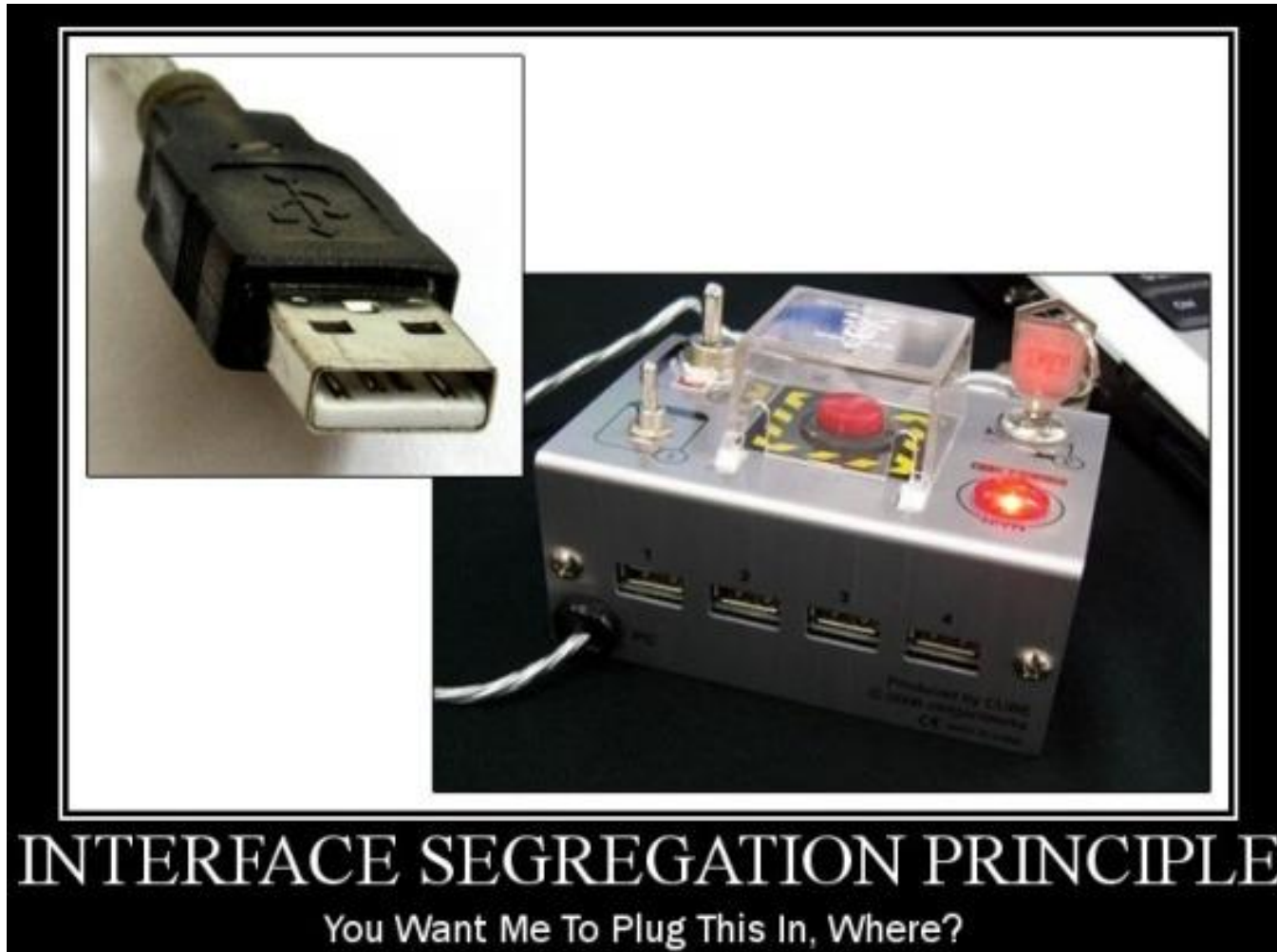
    public override int Area()
    {
        return Height*Width;
    }
}
```

# Hönnun sem fylgir LSP

```
public class Square : Shape
{
    public virtual int SideLength { get; set; }

    public override int Area()
    {
        return SideLength * SideLength;
    }
}
```

# Interface Segregation Principle



Mynd Derick Bailey, <http://lostechies.com/derickbailey/2009/02/11/solid-development-principles-in-motivational-pictures>

# Hönnun sem fylgir ekki ISP

```
public interface IConfigurationSettings
{
    // Application identity settings
    string ApplicationName { get; }
    string AuthorName { get; }

    // Performance tuning settings
    int CacheDuration { get; }

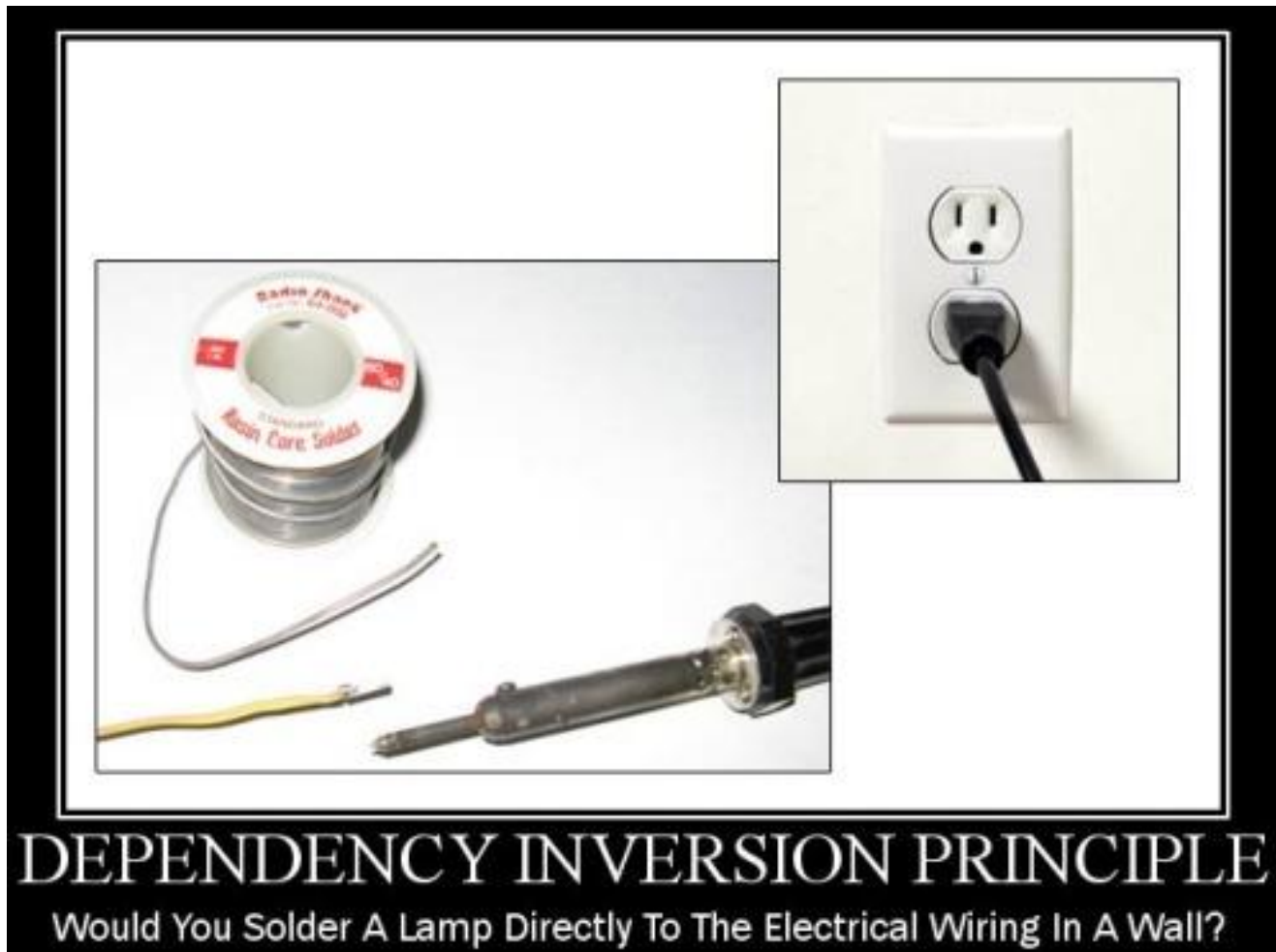
    // Data access settings
    string DatabaseServerName { get; }
    string DatabaseName { get; }
    string DatabaseUserName { get; }
    string DatabasePassword { get; }

    // Web service api settings
    string WebServiceBaseUri { get; }
}
```

# Hönnun sem fylgir ISP

```
public interface IApplicationIdentitySettings
{
    string ApplicationName { get; }
    string AuthorName { get; }
}
```

# Dependency Inversion Principles





# Hönnun sem fylgir DIP

```
public class OnlineOrder : Order
{
    private readonly INotificationService notificationService;
    private readonly IPaymentProcessor paymentProcessor;
    private readonly IReservationService reservationService;

    public OnlineOrder(INotificationService notificationService,
        IPaymentProcessor paymentProcessor,
        IReservationService reservationService)
    {
        this.notificationService = notificationService;
        this.paymentProcessor = paymentProcessor;
        this.reservationService = reservationService;
    }
}
```

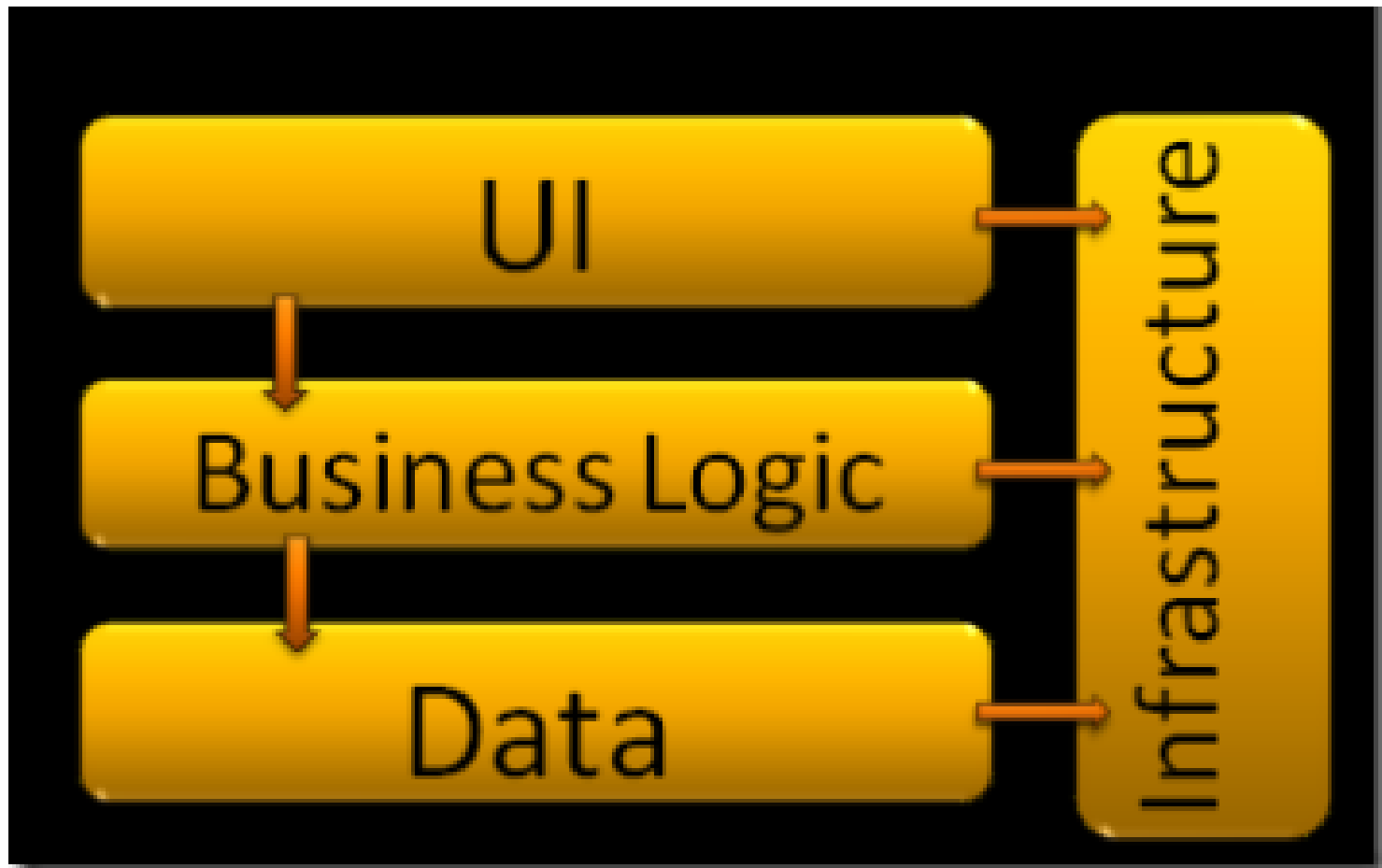


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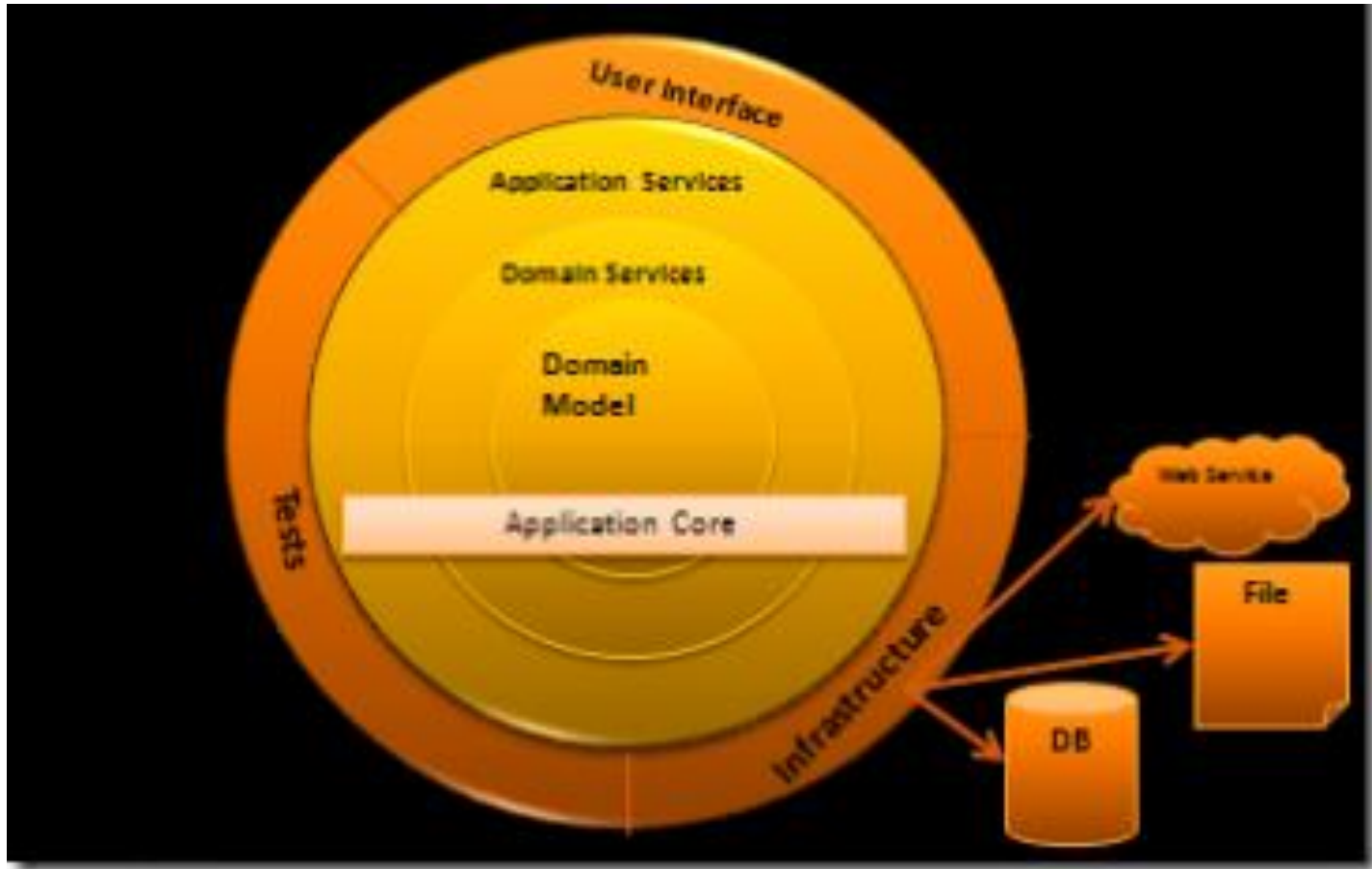
The Onion Architecture

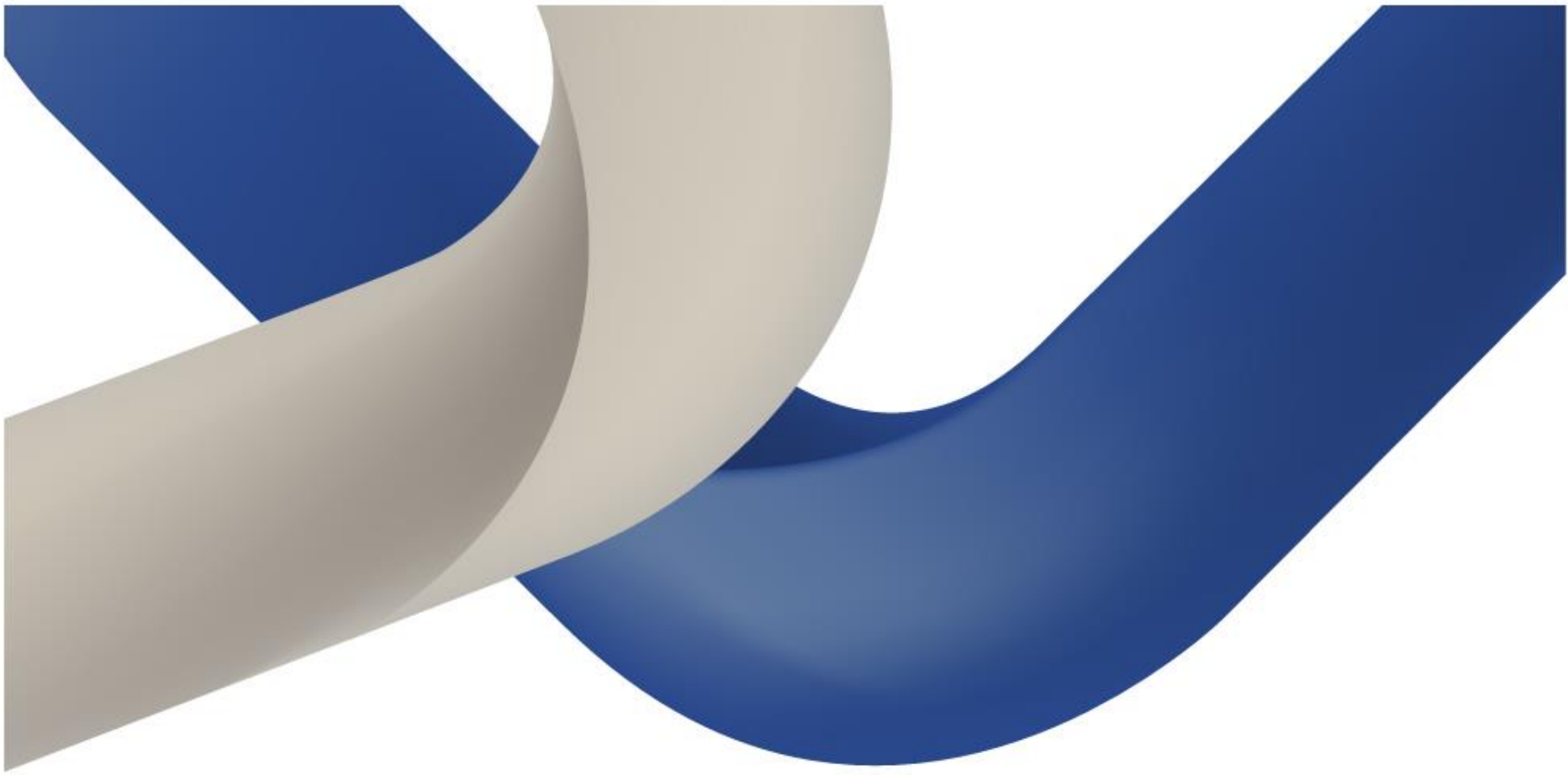
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# 3ja laga högun



# Laukhögünin



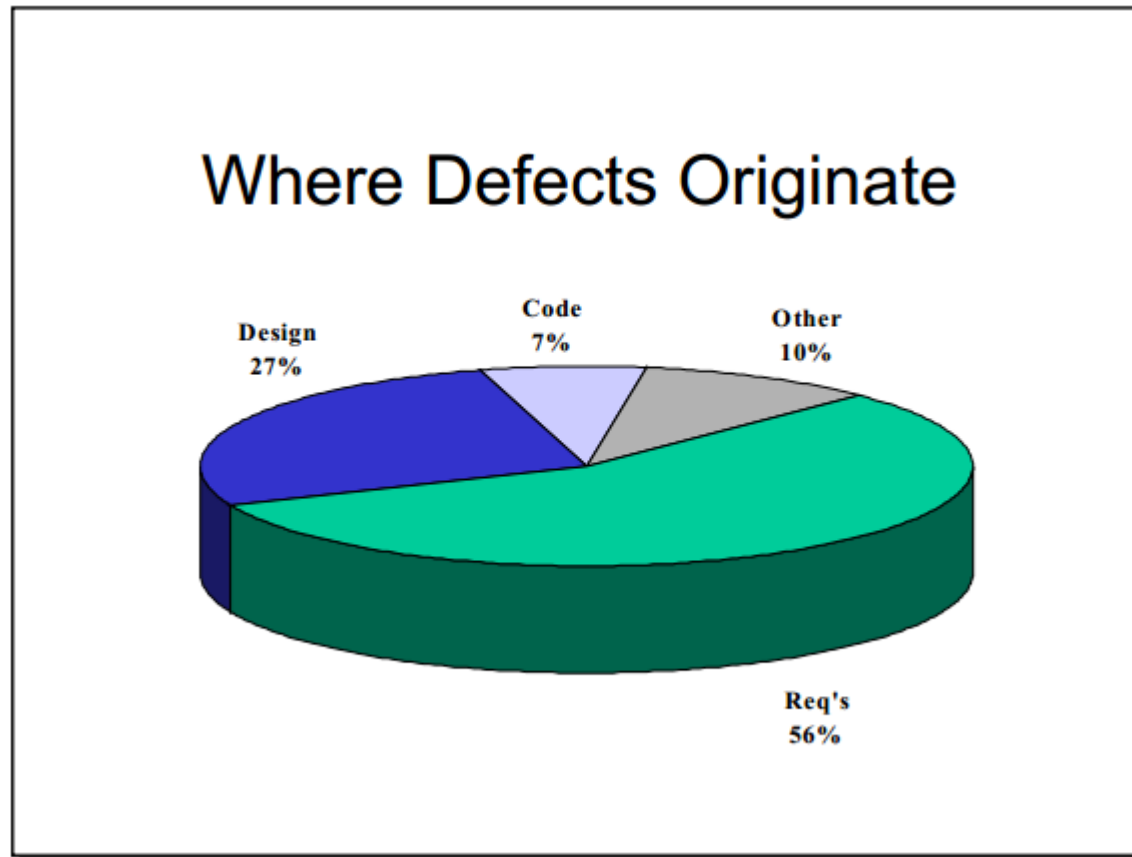


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# Test Driven Development

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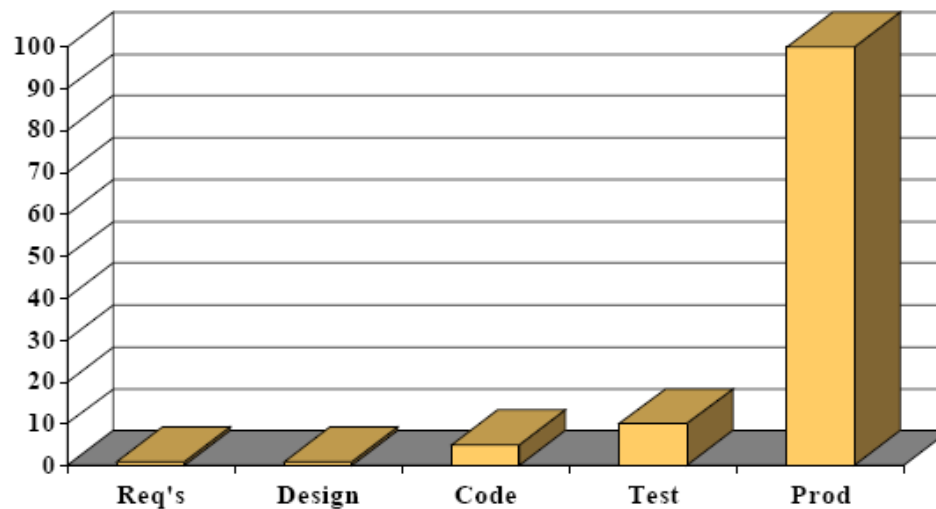
# Tölfræði



Heimild: [http://www.riceconsulting.com/public\\_pdf/STBC-WM.pdf](http://www.riceconsulting.com/public_pdf/STBC-WM.pdf)

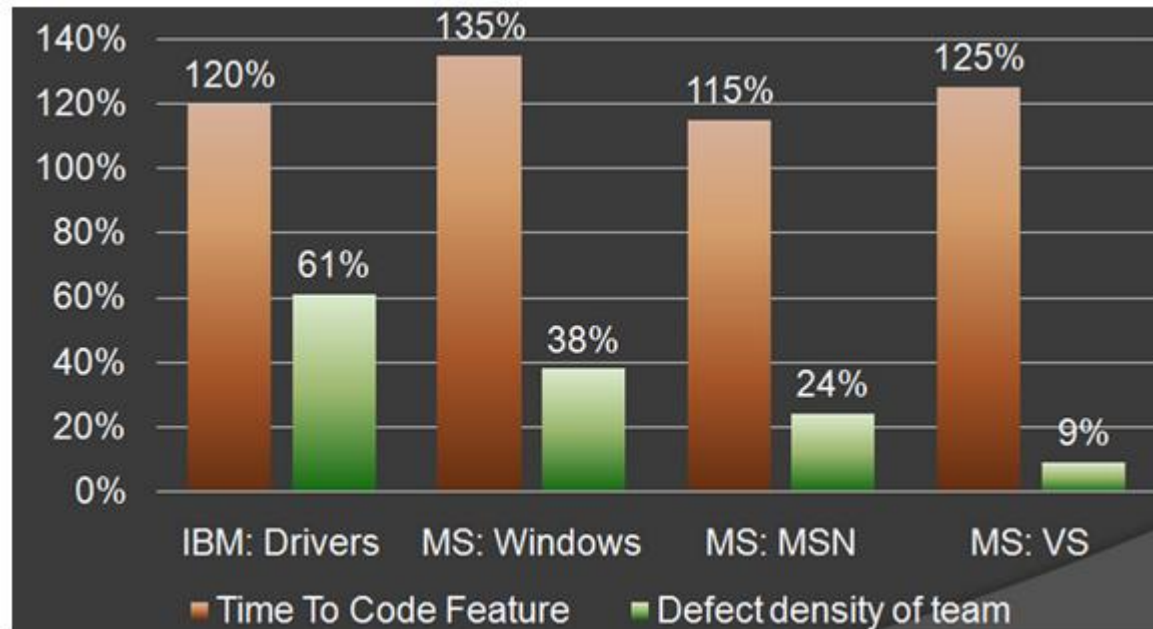
# Tölfræði

## The Relative Cost of Fixing Defects



Heimild: [http://www.riceconsulting.com/public\\_pdf/STBC-WM.pdf](http://www.riceconsulting.com/public_pdf/STBC-WM.pdf)

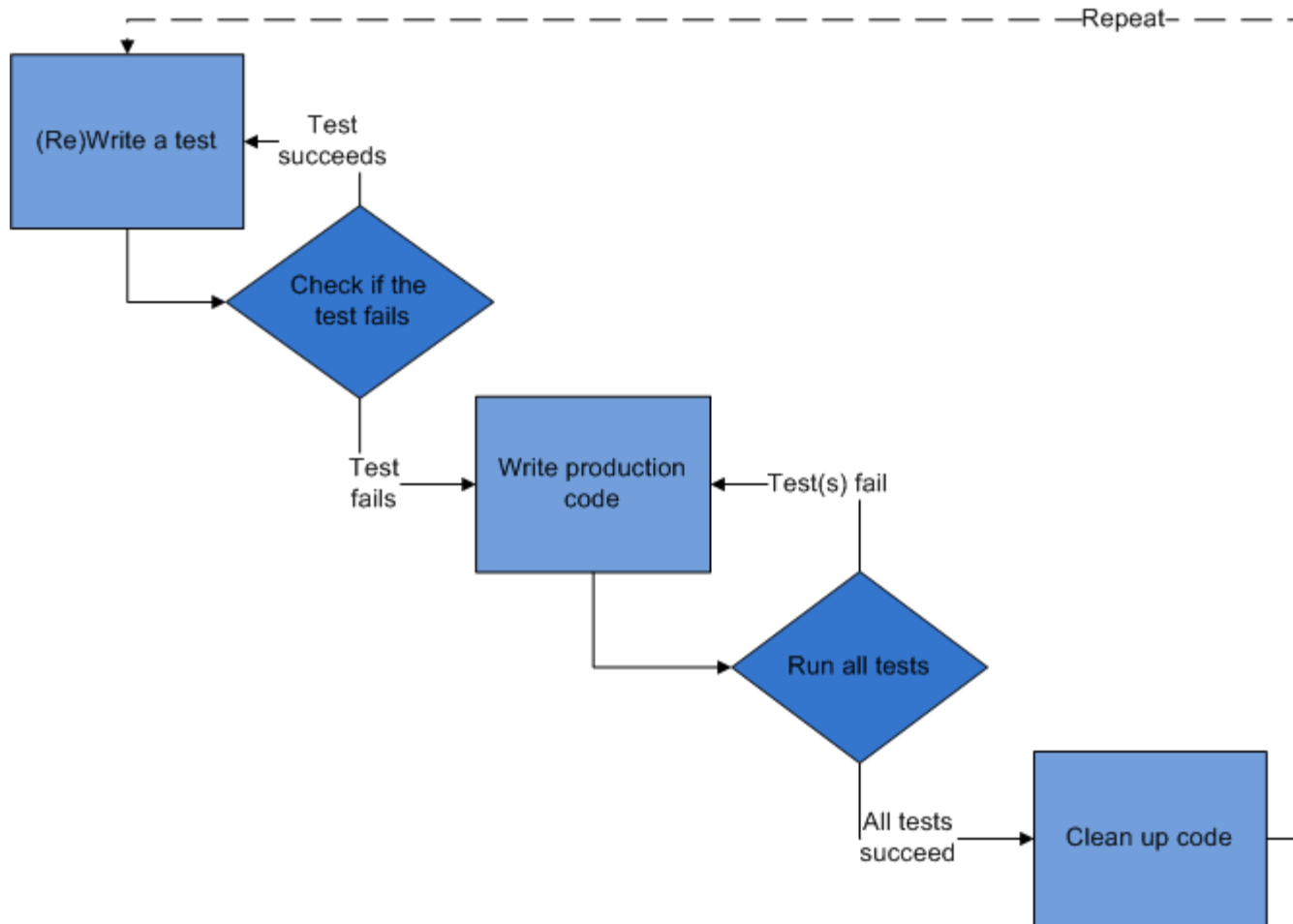
# Case Studies



Heimild: [http://research.microsoft.com/en-us/groups/ese/nagappan\\_tdd.pdf](http://research.microsoft.com/en-us/groups/ese/nagappan_tdd.pdf)



# Red - Green - Refactor



# Helstu niðurstöður

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- Flóknari hönnun
- Lengri þróunartími
- Hentar ekki litlum hugbúnaðarverkefnum
- Hár lærdómsþröskuldur

# Helstu niðurstöður

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- Styður vel við breytilegar kröfur í alþjóðlegu umhverfi
- Gerir okkur kleift að uppfylla mismunandi kröfur viðskiptavina
- Færri villur
- Lengri líftími tölvukerfa



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Takk fyrir

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