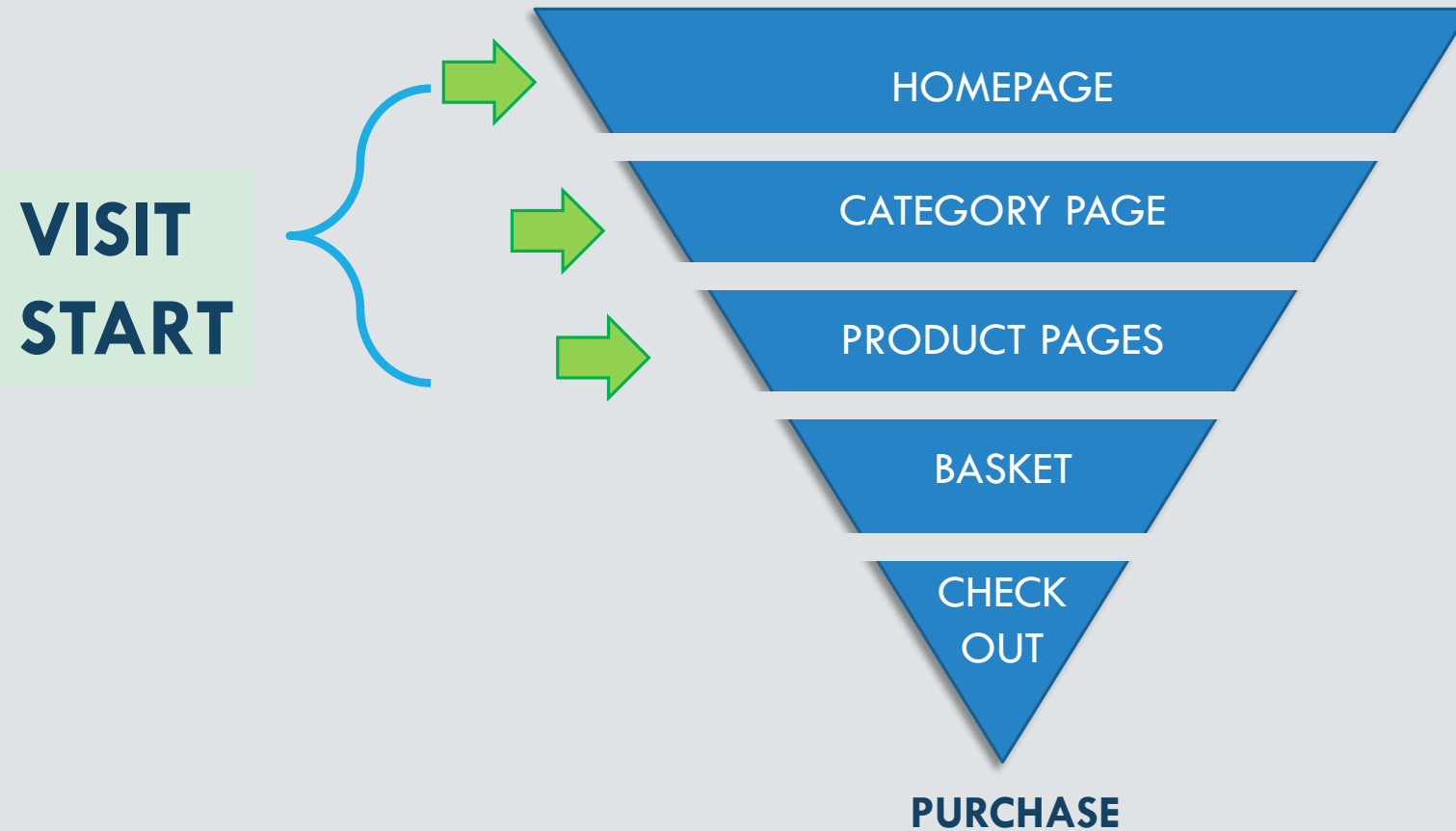




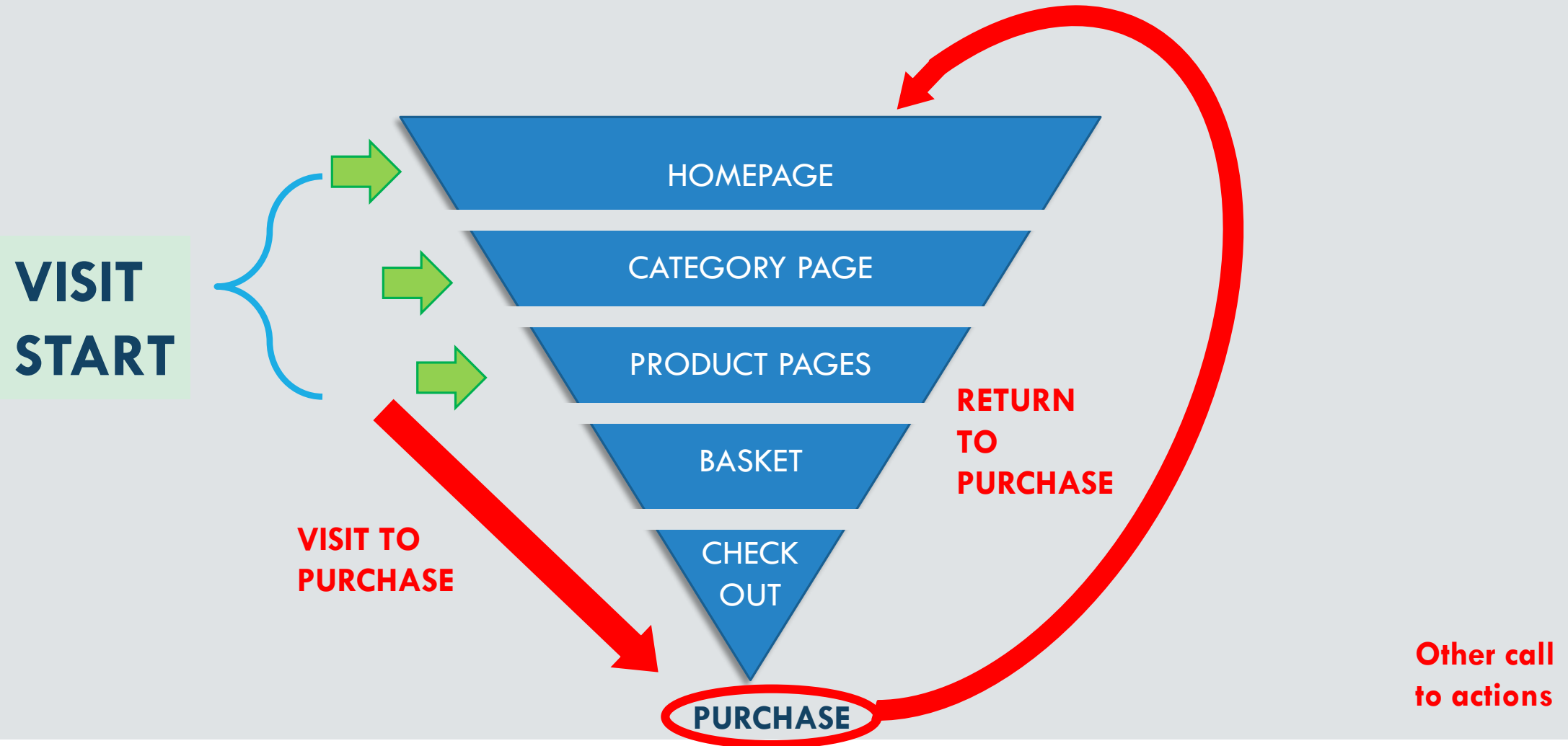
USING R TO UNDERSTAND REVENUE BENEFIT FOR YOUR ONLINE BUSINESS

Catie Gamble – Data Scientist
Marks and Spencer .com

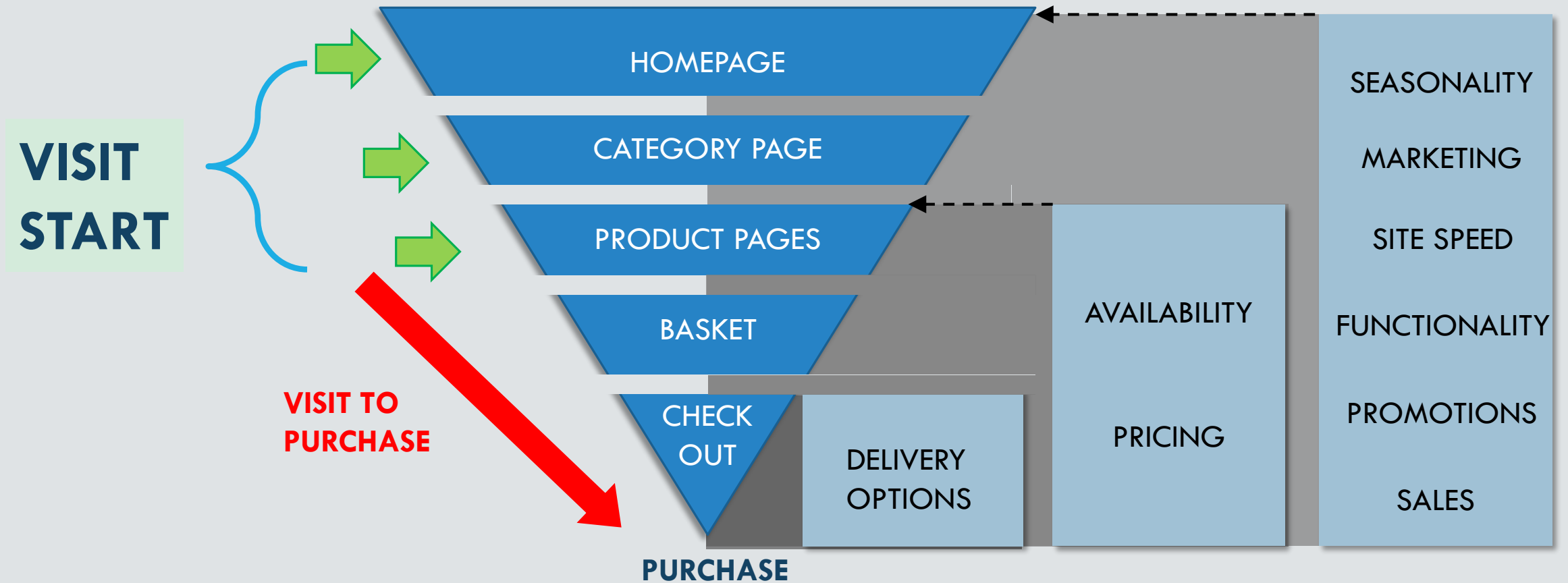
ONLINE RETAIL BASICS



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ONLINE RETAIL BASICS



PROBLEMS FACED

New feature added to site during promotional period
We know the new feature drove higher conversion or customer engagement
But by how much?

Potential new initiative or strategy will bring additional revenue
But is set to degrade performance/delivery/etc...
How much additional revenue will be offset?

Scenario test several options for the same initiative
Which option is the most profitable/engages the customer the most?

and...Feature/Initiative cannot be measured by AB test

EXAMPLE IN R — THE PROBLEM

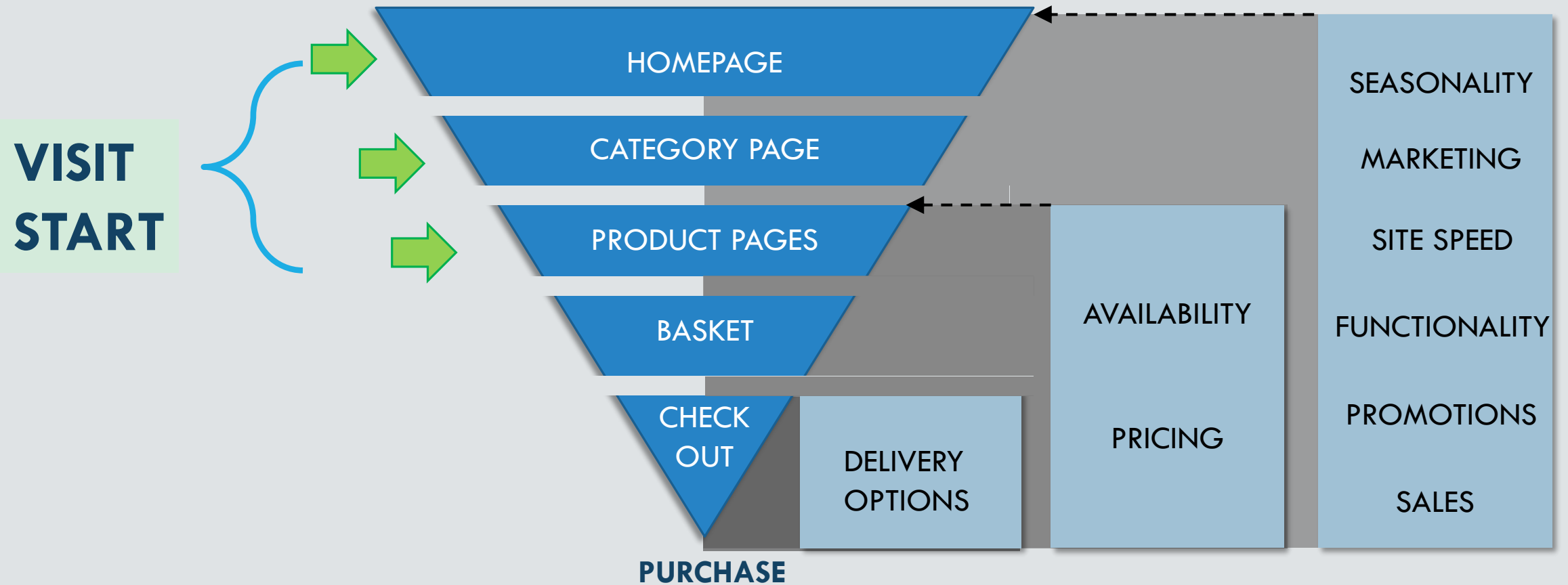
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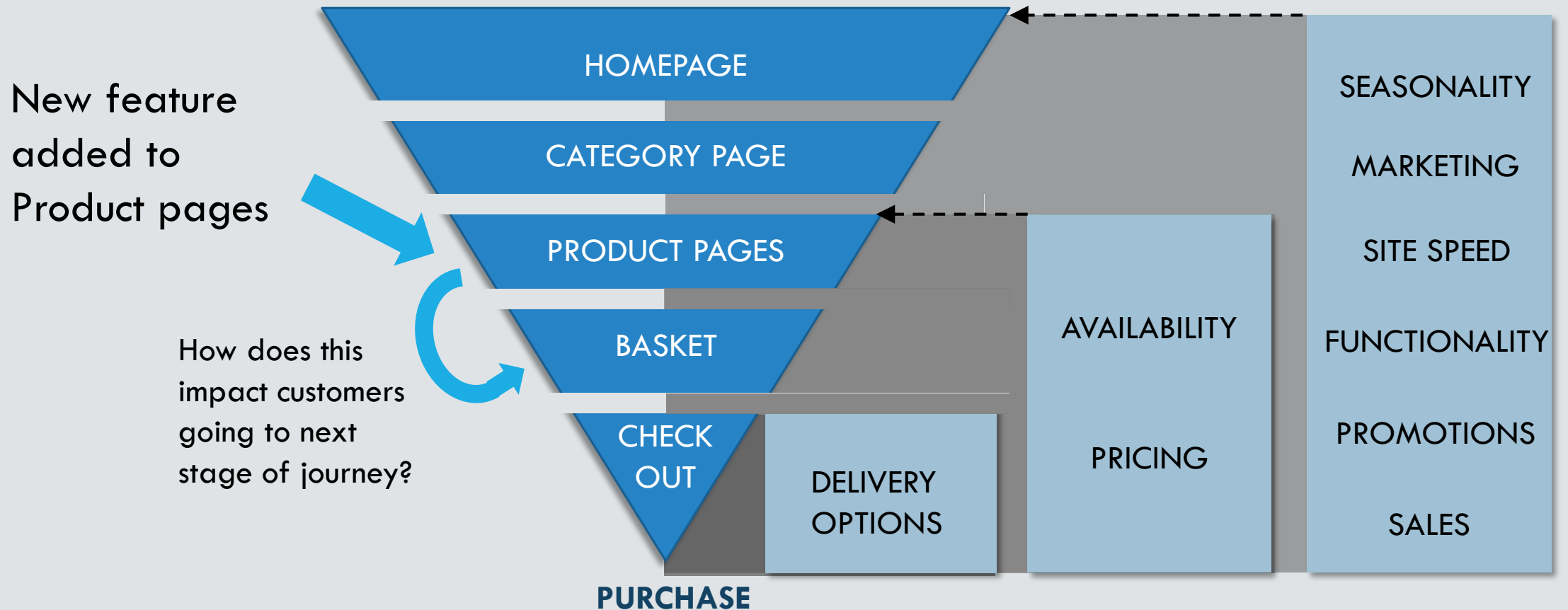
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ONLINE RETAIL BASICS



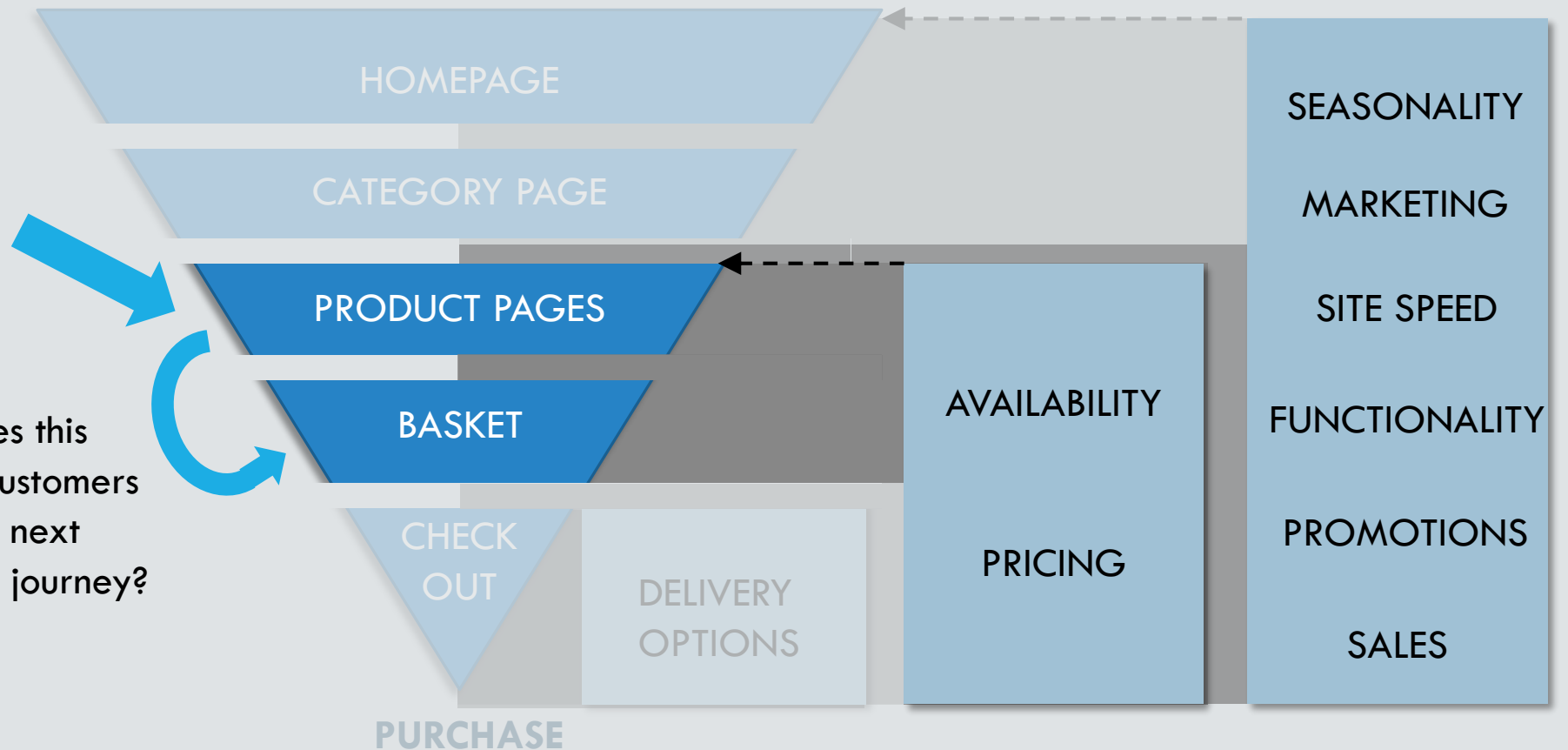
EXAMPLE IN R – THE PROBLEM



EXAMPLE IN R – THE PROBLEM

New feature added to Product pages

How does this impact customers going to next stage of journey?



EXAMPLE IN R – REGRESSION

Product Page to
Add to Basket
Conversion Rate
%



=

Intercept

+



+

Impact of
New feature
added to
Product pages

EXAMPLE IN R – REGRESSION – STEPS

1 Format data + exploratory analysis

date	device	ATB cr	
			...
			...

2

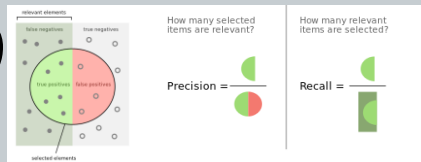
Build model.

```
> model<-glm(pdp_atb_rate~seasonality_data
+ +marketing_data+page_load_data
+ +promo_sales_data+availability_data
+ +pricing_data+...
+ ,family=binomial(link=logit),data)
```

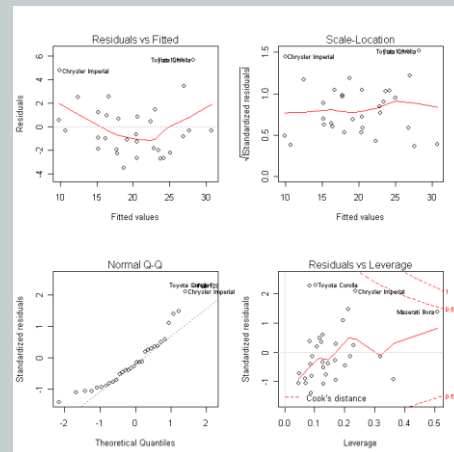
Consider interaction

variables `page load data*promo sales data`

3 Model diagnostics




$$\text{MSE} = \frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2$$



4

Financial uplift

$$\text{Impact on ATB Rate} \times \text{Visits} \times \text{Conversion Rate} \times \text{AOV} = \text{Potential Revenue Impact}$$


WHAT TO MODEL?

Marketing

Propensity Modelling

```
> glm(, , family=  
+ binomial(link=logit)) > rpart()  
> randomForest()
```

Marketing/Visit Forecasting

```
> glm(, , family=poisson)
```

**VISIT
START**

Funnel KPI modelling

HOMEPAGE

Exit rate
predictions

```
> glm()  
> lm()
```

CATEGORY PAGE

PRODUCT PAGES

Add to basket

```
> glm(, , family=  
+ binomial(link=logit))  
> rpart()  
> randomForest()
```

BASKET

CHECK
OUT

Checkout to purchase > rpart()

```
> glm(, , family=  
+ binomial(link=logit))  
> lm() > randomForest()
```

PURCHASE

Customer
segmentation

```
> kmeans()  
> hclust()
```

Control groups

```
> rpart()  
> randomForest()  
> glm(, , family=  
+ binomial(link=logit))
```