Customer Acquisition Dynamics

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Customer Model 1
(Reinforcing Loop)

Customers(t) = Customers(t - dt) + (Customer_Recruitment) * dt
INIT Customers = 100

INFLOWS:
Customer_Recruitment = Marketing_Spend*Productivity
Marketing_Spend = Revenue*Marketing_Spend_Fraction
Marketing_Spend_Fraction = 0.08
Productivity = 0.05
Revenue = Customers*Revenue_per_Customer
Revenue_per_Customer = 50
Customer Model 2  
(Reinforcing Loop with Balancing Loop)

\[
\text{Customers}(t) = \text{Customers}(t - dt) + (\text{Customer\_Recruitment}) \times dt
\]
INIT Customers = 100

INFLOWS:
\[
\text{Customer\_Recruitment} = \text{Marketing\_Spend} \times \text{Productivity}
\]

\[
\text{Potential\_Customers}(t) = \text{Potential\_Customers}(t - dt) + (- \text{Customer\_Recruitment}) \times dt
\]
INIT Potential\_Customers = 900

OUTFLOWS:
\[
\text{Customer\_Recruitment} = \text{Marketing\_Spend} \times \text{Productivity}
\]
\[
\text{Marketing\_Spend} = \text{Revenue} \times \text{Marketing\_Spend\_Fraction}
\]
\[
\text{Marketing\_Spend\_Fraction} = 0.08
\]
\[
\text{Productivity} = 0.05
\]
\[
\text{Revenue} = \text{Customers} \times \text{Revenue\_per\_Customer}
\]
\[
\text{Revenue\_per\_Customer} = 50
\]
Customer Model 3  
(Introducing a Market Saturation Effect)

\[ \text{Customers}(t) = \text{Customers}(t - dt) + (\text{Customer\_Recruitment}) \times dt \]
INIT Customers = 100

INFLOWS:
Customer\_Recruitment = Marketing\_Spend\*Productivity

\[ \text{Potential\_Customers}(t) = \text{Potential\_Customers}(t - dt) + (- \text{Customer\_Recruitment}) \times dt \]
INIT Potential\_Customers = 900

OUTFLOWS:
Customer\_Recruitment = Marketing\_Spend\*Productivity
Eff ect on Productivity = Potential\_Customers/INIT(Potential\_Customers)
Marketing\_Spend = Revenue\*Marketing\_Spend\_Fraction
Marketing\_Spend\_Fraction = 0.08
Productivity = 0.05\*Eff ect on Productivity
Revenue = Customers\*Revenue\_per\_Customer
Revenue\_per\_Customer = 50
Customer Model 4
(Introducing another loop - Customer Loss)

Customers(t) = Customers(t - dt) + (Customer__Recruitment - Customer_Loss) * dt
INIT Customers = 100
INFLOWS:
Customer__Recruitment = Marketing_Spend*Productivity
OUTFLOWS:
Customer_Loss = Customers*Ave_Customer_Loss
Lost__Customers(t) = Lost__Customers(t - dt) + (Customer_Loss) * dt
INIT Lost__Customers = 0
INFLOWS:
Customer_Loss = Customers*Ave_Customer_Loss
Potential__Customers(t) = Potential__Customers(t - dt) + (- Customer__Recruitment) * dt
INIT Potential__Customers = 900
OUTFLOWS:
Customer__Recruitment = Marketing_Spend*Productivity
Ave_Customer_Loss = 0.05
Effect_on__Productivity = Potential__Customers/INIT(Potential__Customers)
Marketing_Spend = Revenue*Marketing_Spend_Fraction
Marketing_Spend_Fraction = 0.08
Productivity = 0.05*Effect_on__Productivity
Revenue = Customers*Revenue_per_Customer
Revenue_per_Customer = 50