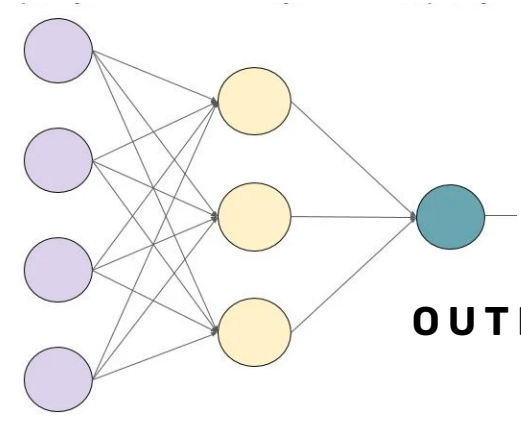
GENERAL FLOW OF AGENT MODELING WITH NEURAL NETWORKS

CHOOSE AGENTS

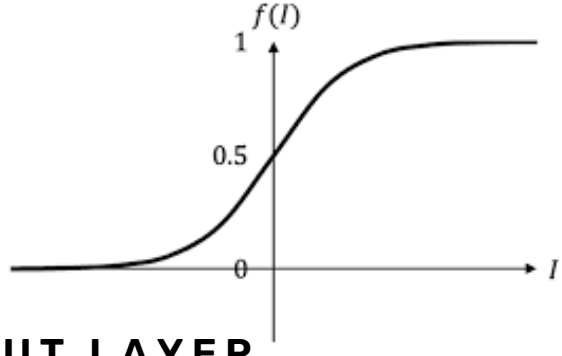
LEARN ABOUT THE RELATIONSHIPS

LEARN ABOUT INVERSE RELATIONSHIPS



INPUT LAYER

OUTPUT LAYER



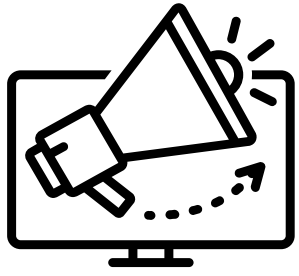
MULTILAYER PERCEPTRON WITH 1 HIDDEN LAYER

OUTPUT UNIT WITH SIGMOID ACTIVATION FUNCTION

EXPLANATION AS PER RESEARCH PAPER: AGENTS USED

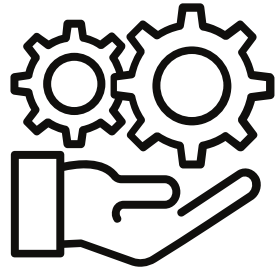
CHOOSE AGENTS

MARKETING AGENT



LEARNS THE RELATIONSHIP BETWEEN TECHNICAL FEATURES AND PERCEPTIONS AS WELL AS THE RELATIONSHIP BETWEEN PERCEPTIONS AND ATTRACTIVENESS OF THE PRODUCT

PRODUCTION AGENT



LEARNS THE RELATIONSHIP BETWEEN PRODUCTION PROCESSES AND TECHNICAL PRODUCT FEATURES AS WELL AS THE RELATIONSHIP BETWEEN PRODUCTION PROCESSES AND COSTS

PART WISE EXPLANATION AS PER RESEARCH PAPER

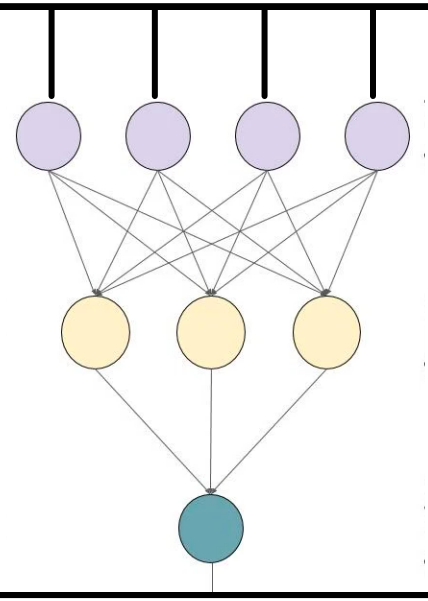
FOR THE PRODUCTION AGENT :

LEARN ABOUT THE RELATIONSHIP BETWEEN TECHNICAL FEATURES & PRODUCTION PROCESS

USING

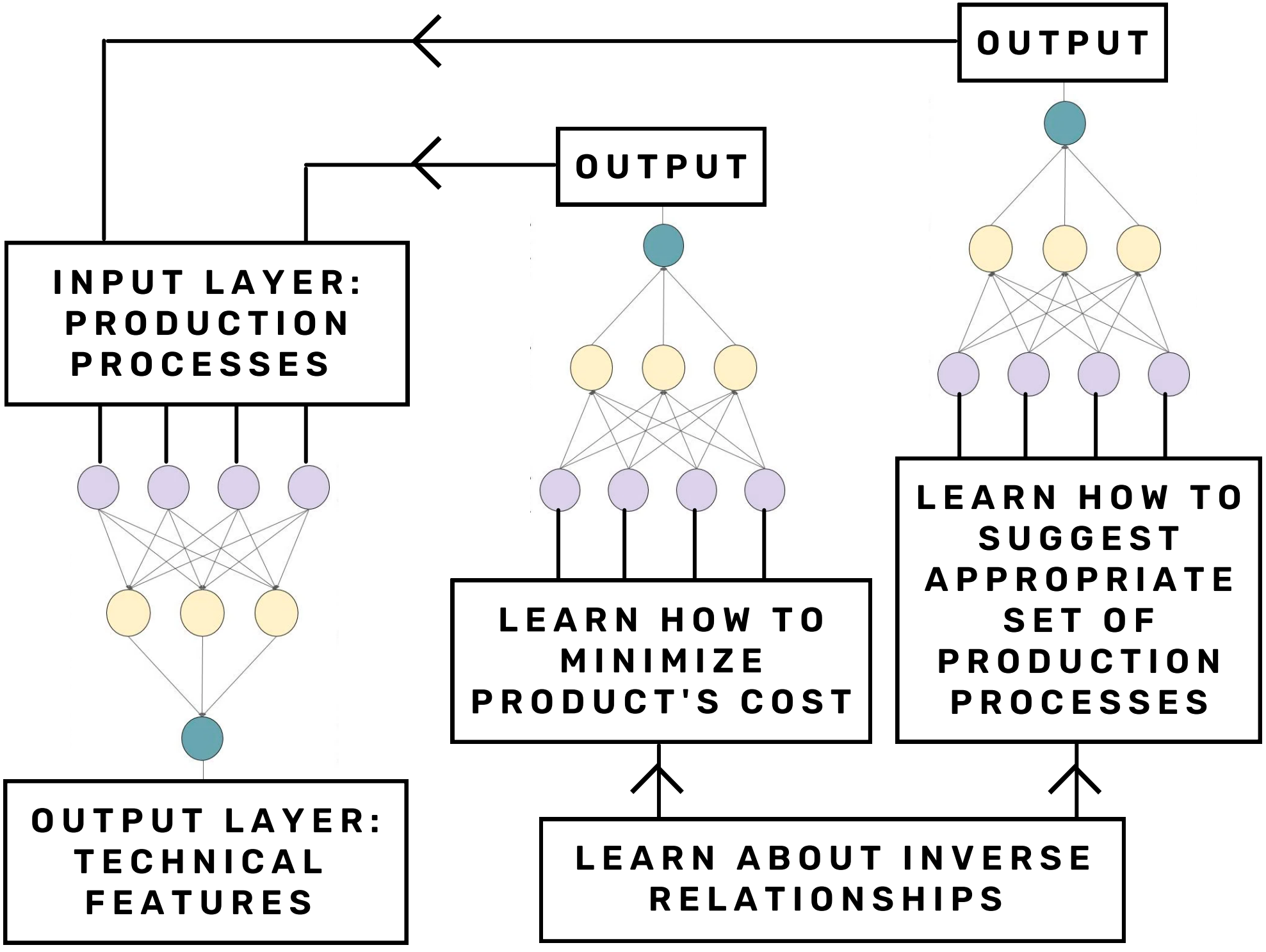
MULTILAYER PERCEPTRON WITH 1 HIDDEN LAYER

INPUT LAYER : PRODUCTION PROCESSES



OUTPUT LAYER : TECHNICAL FEATURES

**PLEASE NOTE THAT THE MARKETING AGENT IS MODELLED IN A SIMILAR MANNER


OUTPUT
OUTPUT
INPUT LAYER: PRODUCTION PROCESSES
LEARN HOW TO SUGGEST APPROPRIATE SET OF PRODUCTION PROCESSES
LEARN HOW TO MINIMIZE PRODUCT'S COST
OUTPUT LAYER: TECHNICAL FEATURES
LEARN ABOUT INVERSE RELATIONSHIPS

ASSUMPTIONS DURING MODELING

ASSUMPTIONS

- Recognizing that knowledge & learning is limited for humans, & modeling this accordingly, we can describe the bounded rationality
- Performance depends on discoverable structure given by training data
- Neural networks don't arrive at most optimal, best fitted solution, but solution that mimics limits of what humans learn through experience.
- Neural networks only models long-term learning and knowledge is. It reflects only long-term expertise of agent, given past experience, to achieve solution by approximating the unknown function.

GOALS DURING MODELING

GOALS

- Capture major aspects of human learning and performance using a realistic implementation of a cognitive model
- Major goal is to demonstrate behavior of complex systems guided by boundedly rational agents

PREDICTION OF PRODUCT DESIGN & DEVELOPMENT SUCCESS USING ANN

(RESEARCH PAPER REFERRED TO: LINK)

AIM: EXPLORE RELATIONSHIP BETWEEN NPD SUCCESS FACTORS AND PRODUCT PERFORMANCE BY USING ANN

INPUT: OBTAINED FROM A SURVEY OF 57 ELECTRONICS BASED COMPANIES IN THAILAND

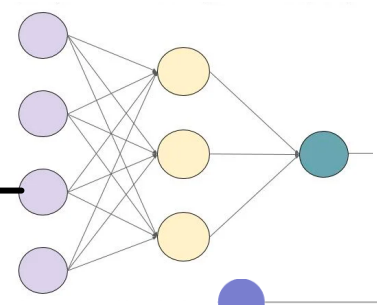
- COMPANIES EMPLOYING NPD PROCESS
- COMPANIES THAT DON'T HAVE NPD PROCESS

THESE 2 GROUPS OF DATA ARE PREDICTED SEPARATELY AND EACH GROUP IS RANDOMLY SEPARATED INTO 3 SETS

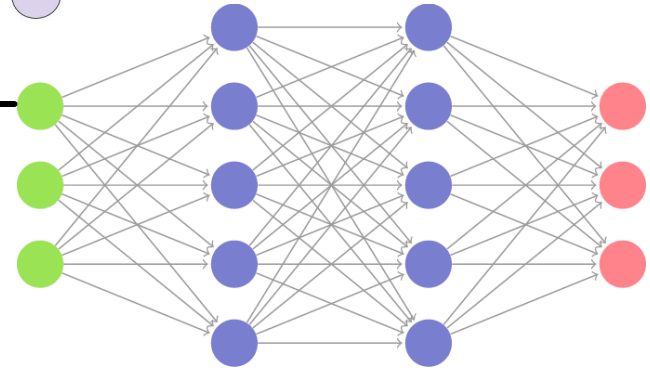
	TRAINING		VALIDATION		TEST
RATIO SPLIT INTO :	4	:	1	:	1

INPUT DATA FROM SURVEY

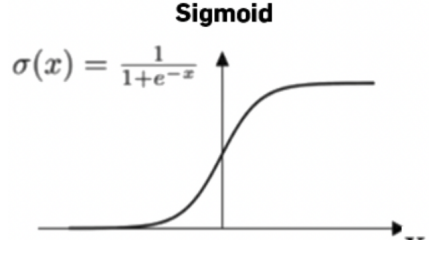
FEED-FORWARD NEURAL NETWORK WITH BACK PROPAGATION TECHNIQUE IS USED. BY TRIAL AND ERROR WE SELECT WHETHER IT WILL HAVE 1/2 HIDDEN LAYERS

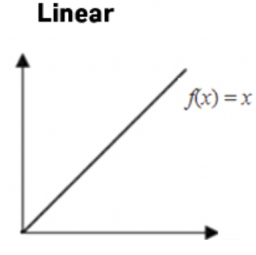


OR



SIGMOIDAL & LINEAR FUNCTION ARE USED AS ACTIVATION FUNCTION





MEAN SQUARED ERROR IS USED AS A PERFORMANCE GOAL FOR TRAINING

$$\mathrm{MSE} = \frac{1}{n}\sum_{i=1}^{n}(Y_i - \hat{Y}_i)^2$$