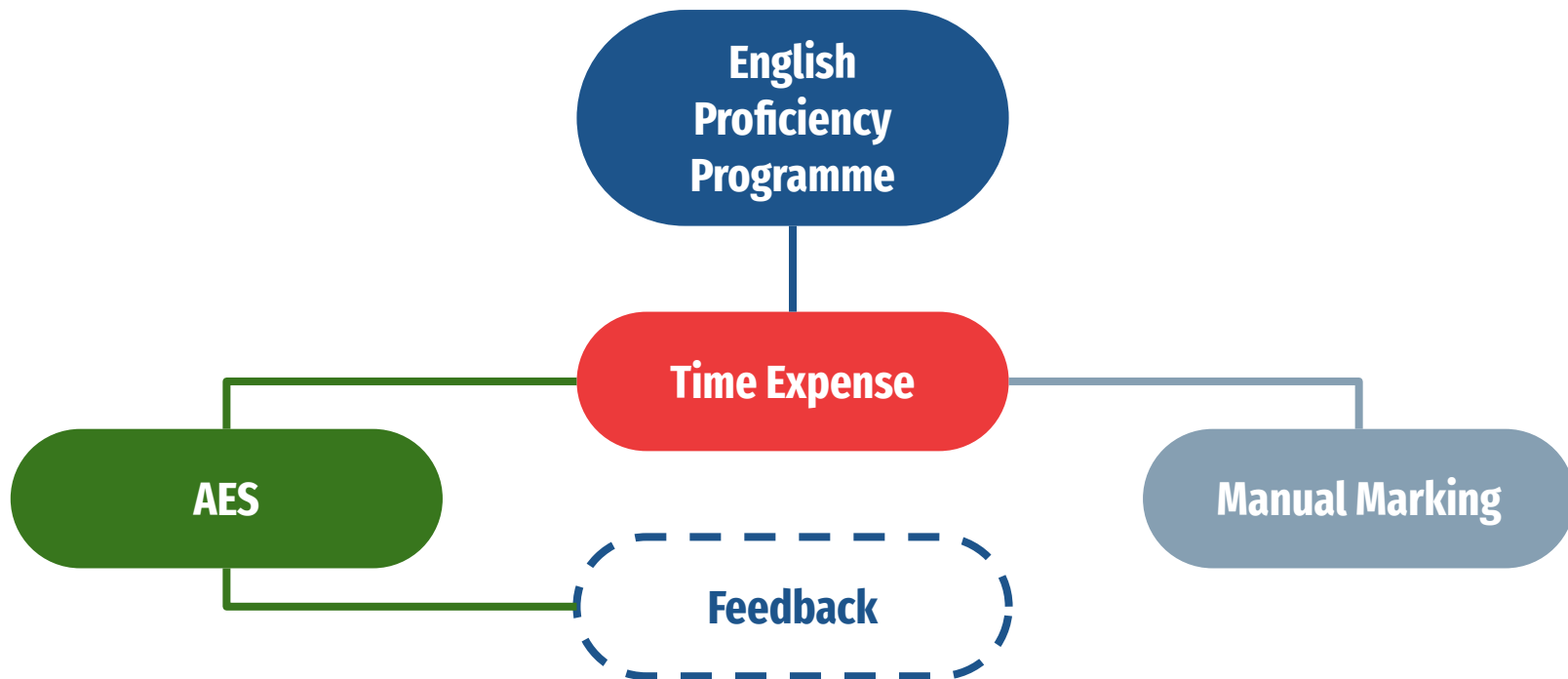


An Automatic Essay Scorer for the School of Linguistics

By James Rowles
Supervised by Sharon Gao

About



Design

Continuous
Output

Regression, Neural

Linearity

Regression

Available
Datasets

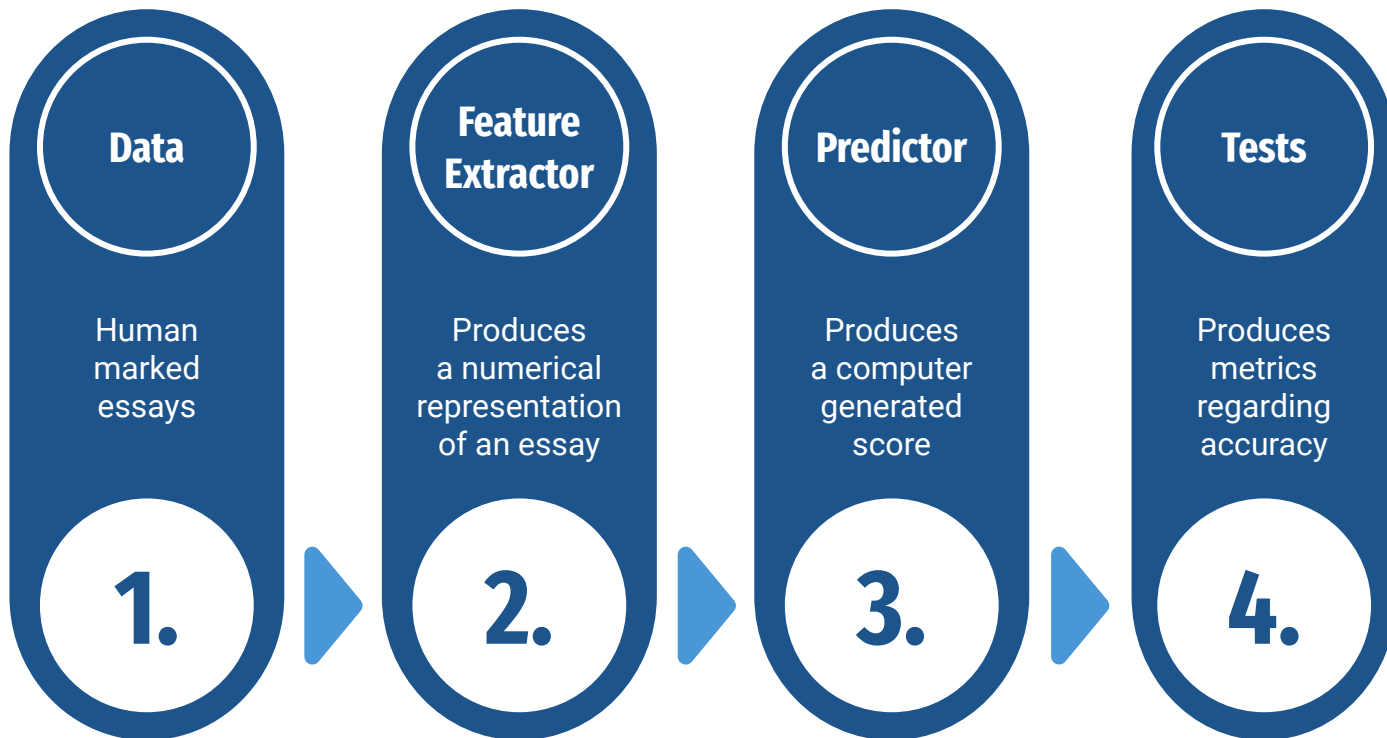
Feature Engineering

Explain-ability

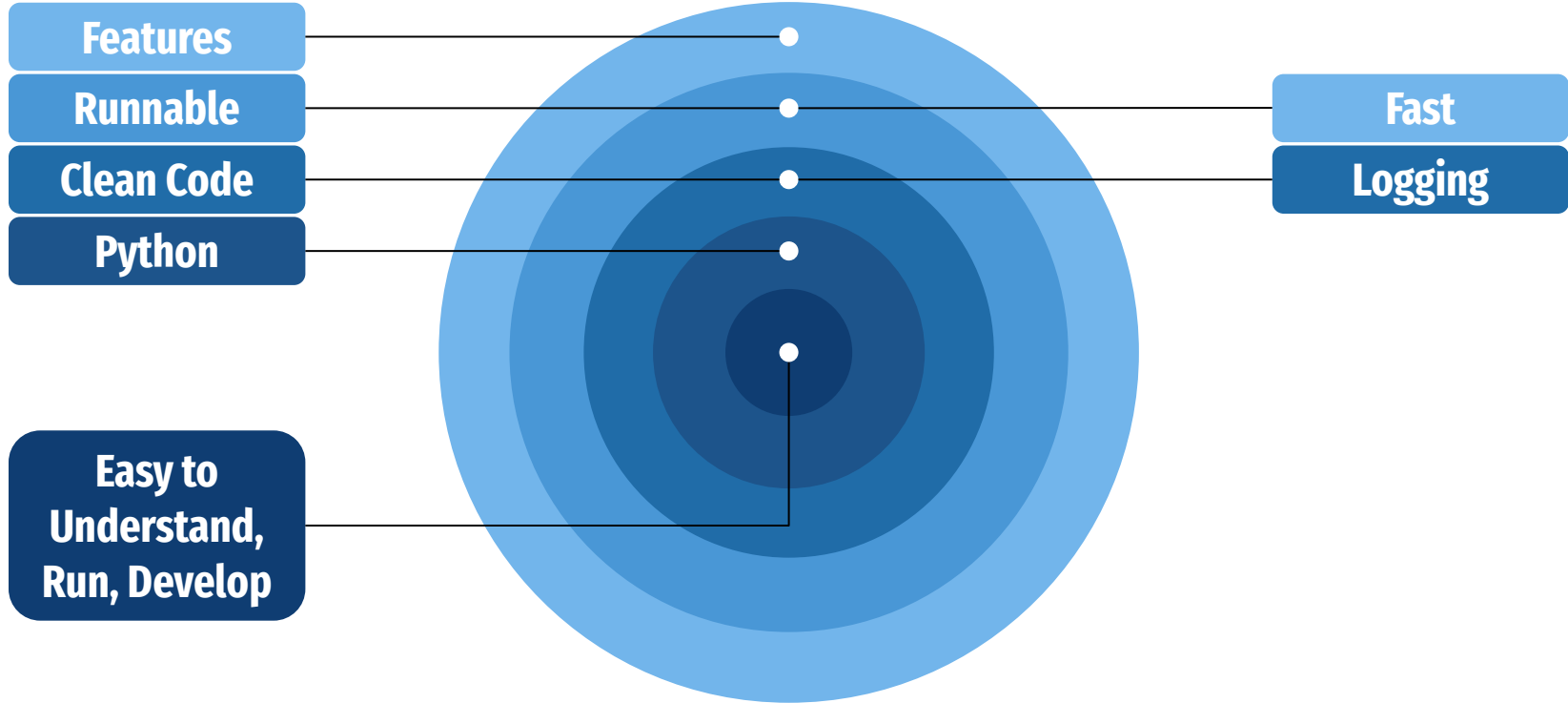
Feature Engineering

Feature Engineering
with
Regression Models

The System

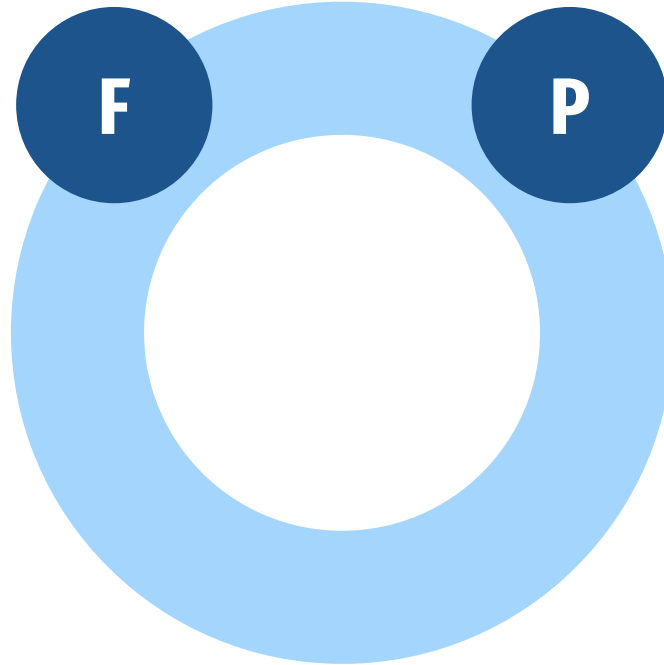


Implementation



Evaluations

F Statistic



**QWK: Quadratic
Weighted Kappa**

**Pearsons
Correlation**













**Adjacent
Agreement %**

**Exact
Agreement %**

Evaluation: Features: F-Stat

	Top 38	Top 13
Vocab	34%	50%
Ideas	5%	5%
Grammar	13%	15%
Flow	26%	26%
Coherence	42%	50%

Evaluation: QWK: Predictions

	VUW	Hewlett
Vocab		
Ideas		
Grammar		 
Flow		
Coherence		
Overall		 

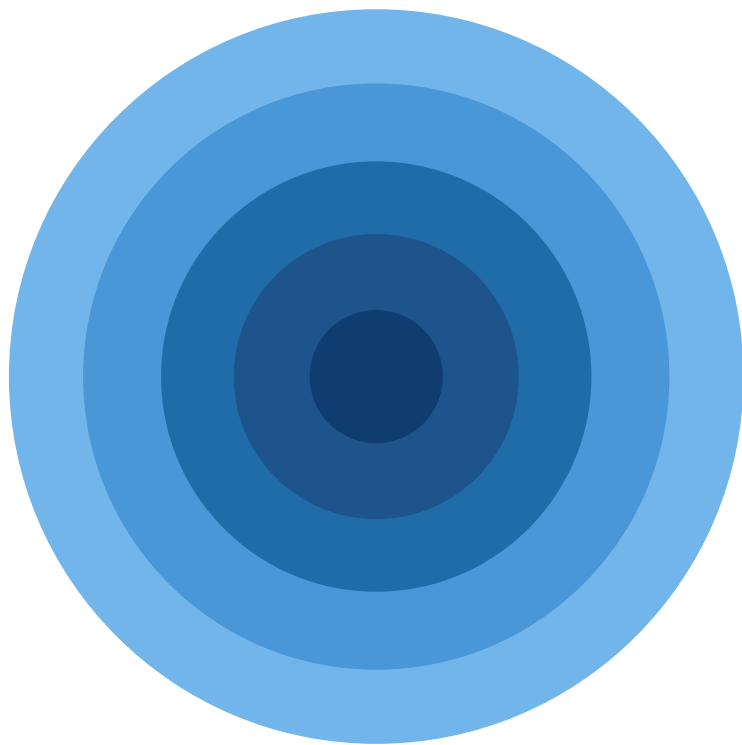
Summary

Easy to Use

**Moderate
Agreements**

**Weak
Categories**

**Lots of
Potential**



Thank You.

VRIO Analysis Infographics



Jupiter is the biggest planet in the Solar System

Despite being red, Mars is a cold place

Venus is terribly hot, even hotter than Mercury

Mercury is the smallest planet of them all

Earth is the only planet that harbors life

EPP

NO

YES

YES

YES

YES

Hewlett

NO

YES

YES

YES

Inimitable

N

YES

YES

Organized

NO

YES

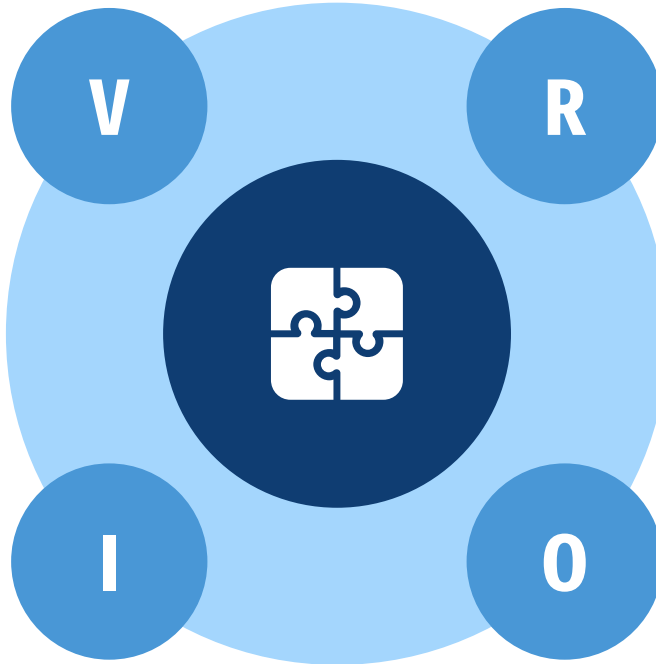
VRIO Analysis Infographics

Valuable

Mercury is the closest planet to the Sun and the smallest one

Inimitable

Venus has a beautiful name and is the second planet from the Sun



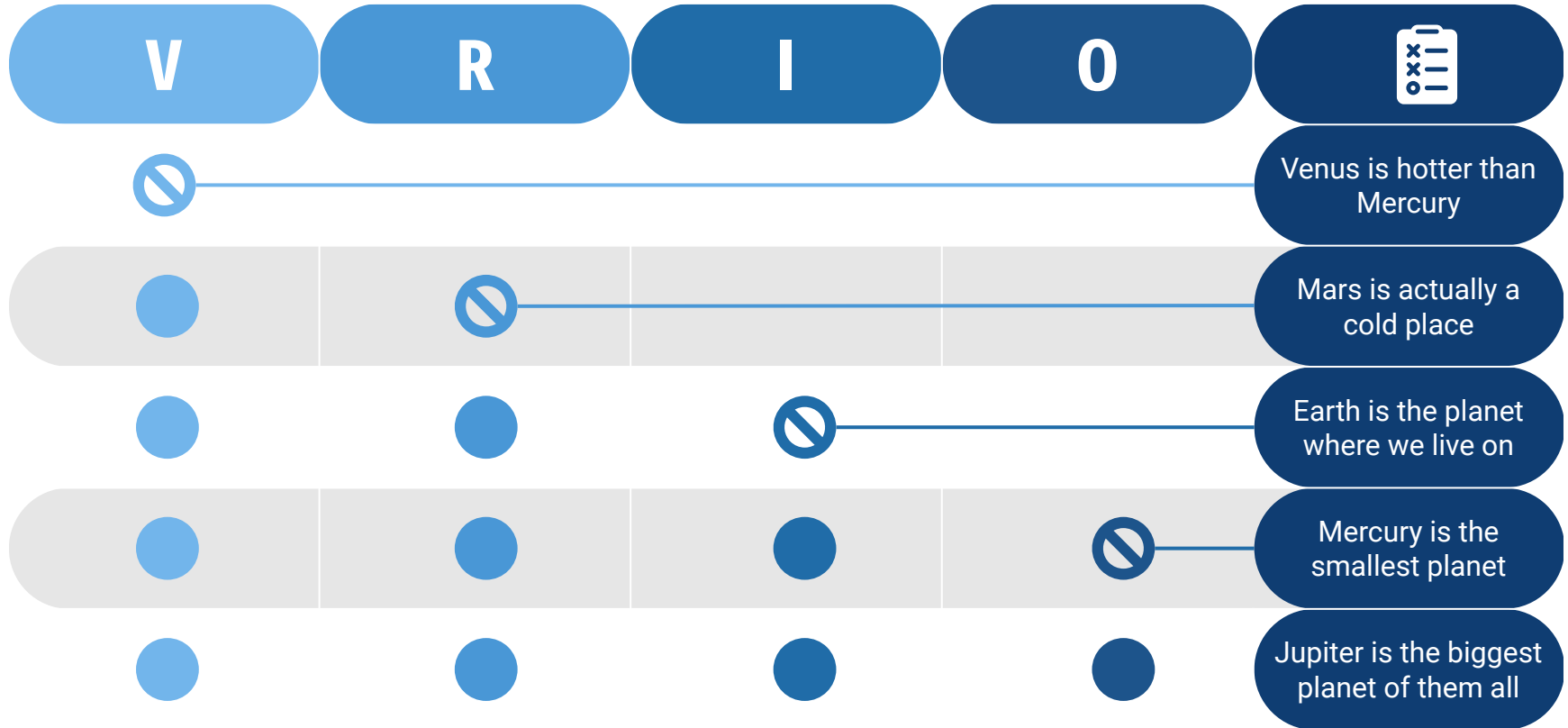
Rare

Despite being red, Mars is actually a cold place full of iron oxide dust

Organized

Earth is the third planet from the Sun and the only one that harbors life

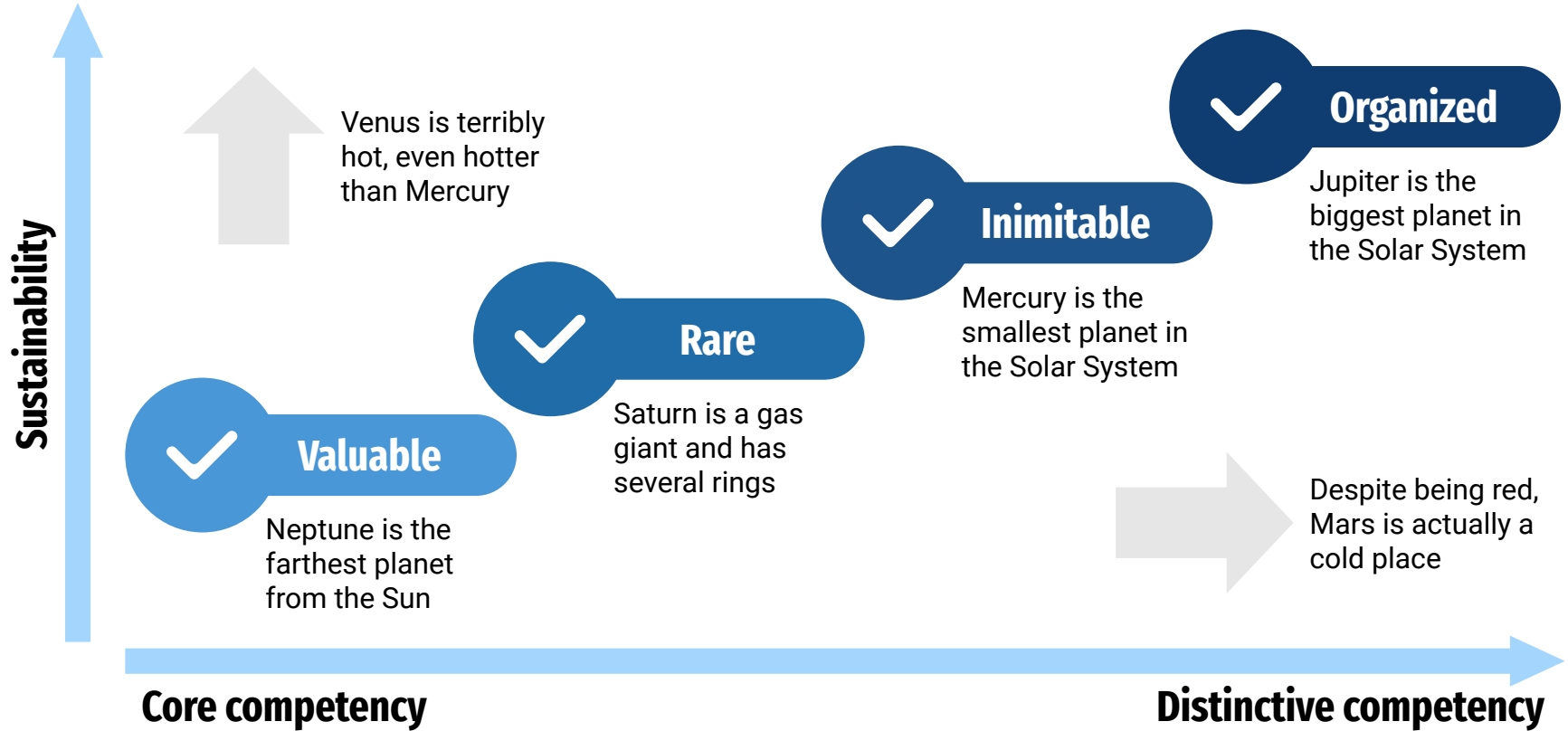
VRIO Analysis Infographics



VRIO Analysis Infographics

Valuable?	Rare?	Inimitable?	Organized?	Impact
No				Jupiter is a big planet
Yes	No			We live on Earth
Yes	Yes	No		Neptune is far away
Yes	Yes	Yes	No	Mars is a cold place
Yes	Yes	Yes	Yes	Mercury is a small planet

VRIO Analysis Infographics



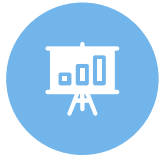
VRIO Analysis Infographics

Features	Valuable	Rare	Inimitable	Organized	Competitive implication	Economic implication
Feature 1	Yes	No	Yes	-	Venus is terribly hot	Normal
Feature 2	No	No	No	No	Mars a cold place	Not normal
Feature 3	No	No	Yes	Yes	Earth is where we live on	Not normal
Feature 4	No	Yes	-	-	Jupiter is a big planet	Normal
Feature 5	Yes	No	-	No	Mercury is small	Normal
Feature 6	-	-	Yes	Yes	Saturn has several rings	Not normal

VRIO Analysis Infographics

Valuable?	Rare?	Inimitable?	Organized?	Description
Ceres is located in the asteroid belt				
Yes	Yes			Mercury is the smallest planet
		Yes	Yes	Earth is where we all live on
	Yes			Venus is hotter than Mercury
The Moon is Earth's only natural satellite				
Yes	Yes		Yes	Jupiter is the biggest planet
	Yes			Saturn has a beautiful name
Yes		Yes	Yes	Mars is actually a cold place

VRIO Analysis Infographics



Valuable

Rare

Inimitable

Organized

Performance



Mercury is small



We live on Earth



Jupiter is a big planet

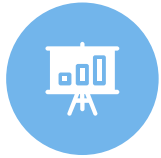


Venus is terribly hot



Saturn has rings

VRIO Analysis Infographics



Valuable

Rare

Inimitable

Organized

Performance



Mercury is small



We live on Earth



Jupiter is a big planet

















Venus is terribly hot

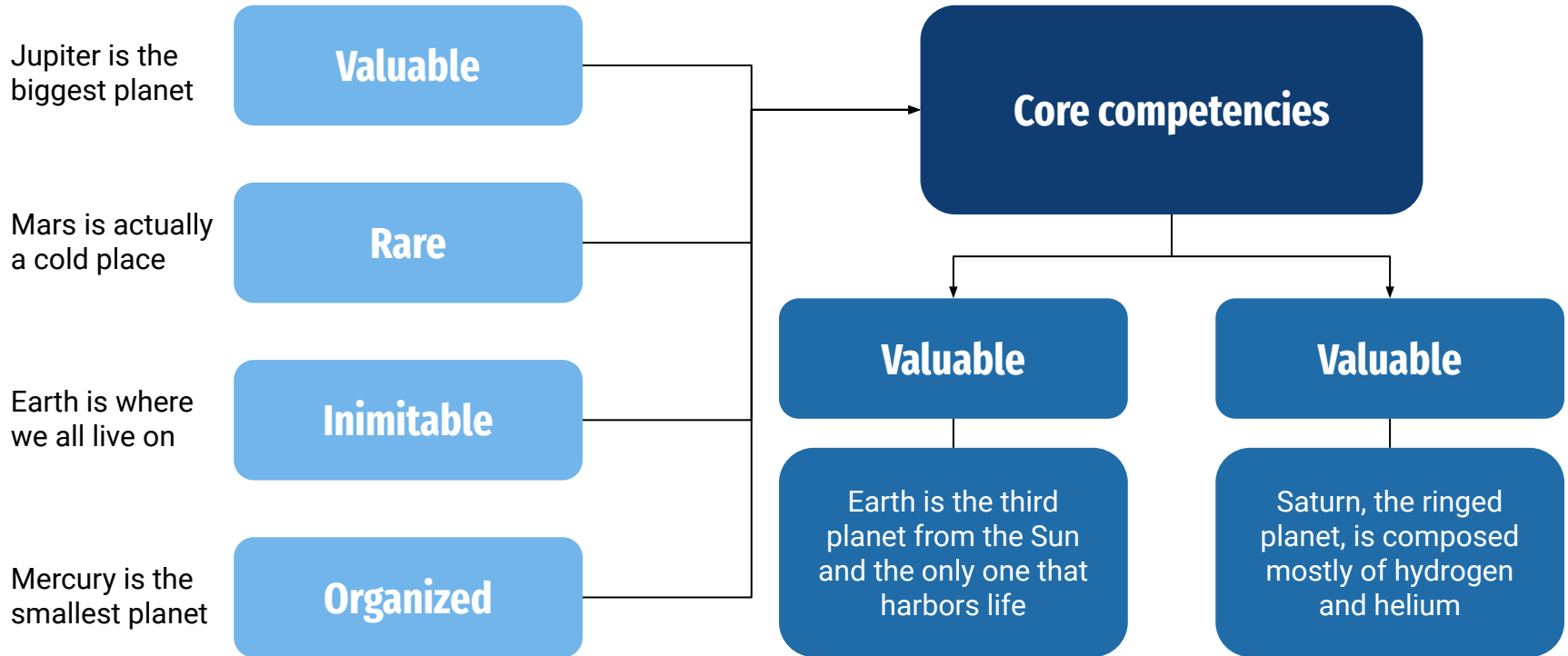


Saturn has rings





























VRIO Analysis Infographics

Valuable	Rare	Inimitable	Organized	Results
V	R	I	O	?
				Jupiter is a big planet
				We live on Earth
				Venus is terribly hot
				Mars is a cold place
				Mercury is small

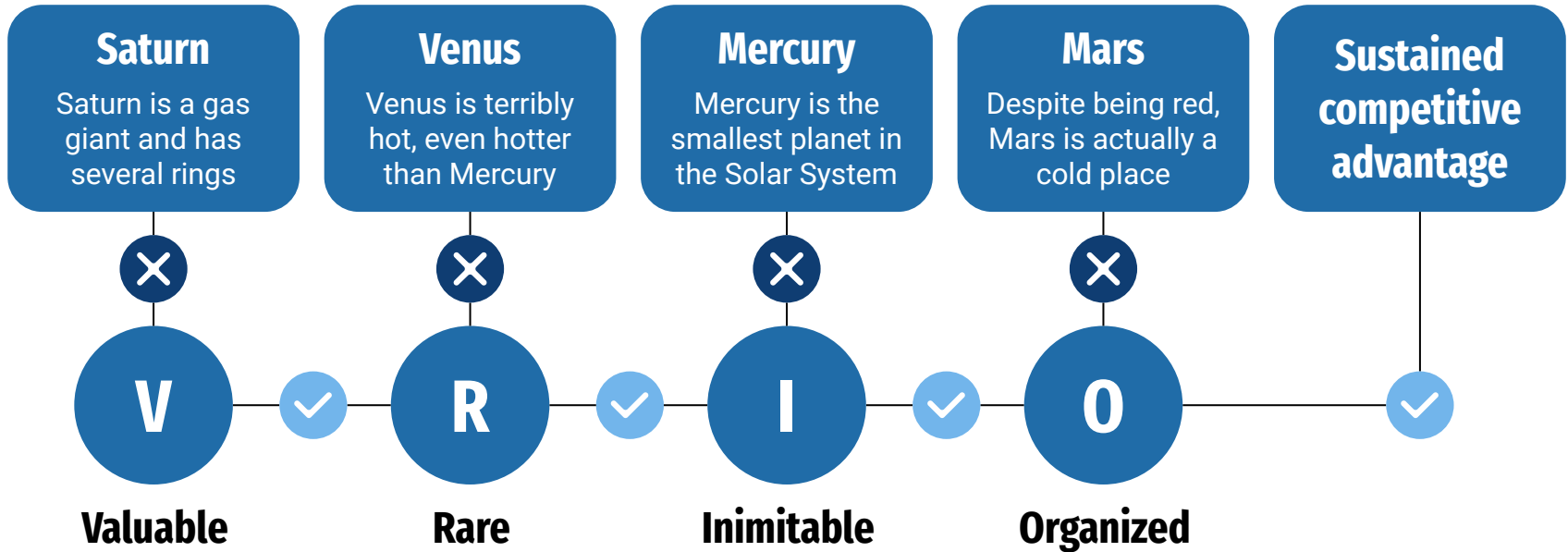
VRIO Analysis Infographics





VRIO Analysis Infographics

					
	Valuable	Rare	Costly to imitate	Organization	Competitive implication
Venus					
Mars					
Jupiter					
Neptune					
Earth					
Uranus					

VRIO Analysis Infographics



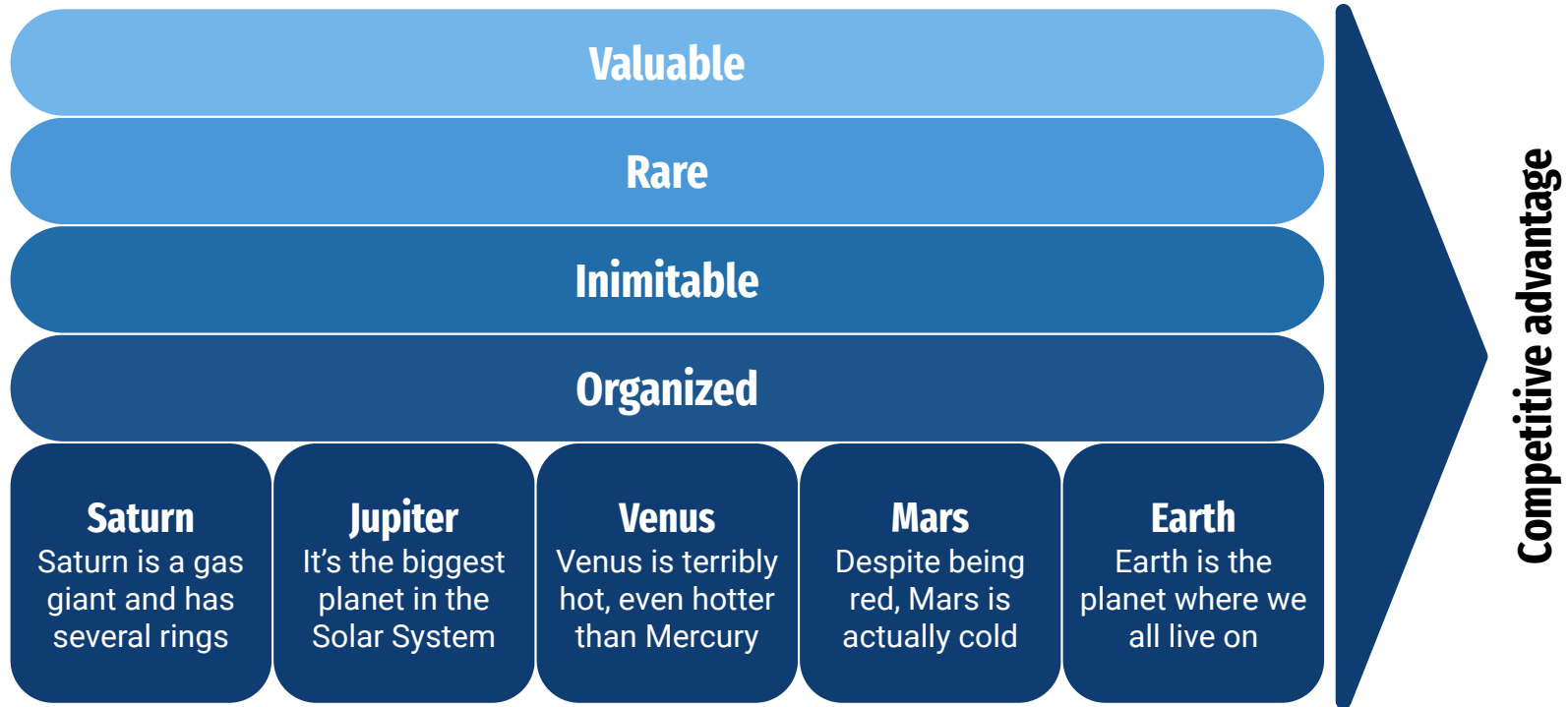
VRIO Analysis Infographics

Capability	Valuable	Rare	Inimitable	Organized	Impact
					
Venus	Yes	Yes	Yes	Yes	Uranus
Mars	Yes	No	No	Yes	Mercury
Jupiter	Yes	No	Yes	Yes	Venus
Neptune	Yes/No	Yes/No	Yes/No	Yes/No	Moon
Earth	Yes/No	Yes/No	Yes/No	Yes/No	Saturn

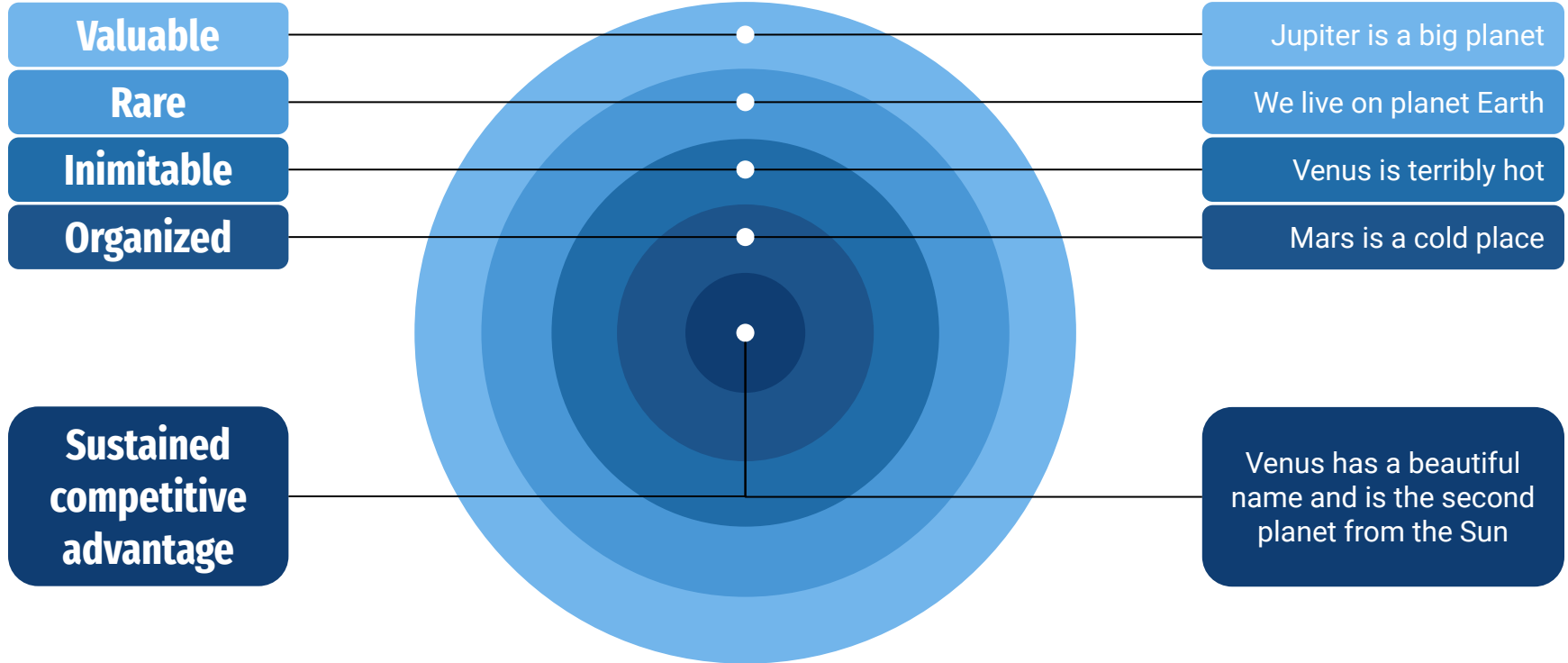
VRIO Analysis Infographics

Resource	Valuable	Rare	Inimitable	Organized	Value
Despite being red, Mars is actually a cold place	✓	✓	✗	✓	Mars
Venus is the second planet from the Sun	✗	✓	✓	✗	Venus
Saturn is a gas giant and has several rings	✓	✗	✗	✓	Saturn
Earth is the third planet and is where we live on	✓	✗	✓	✓	Earth
Mercury is the smallest planet of them all	✗	✓	✓	✗	Mercury
Jupiter is the biggest planet of them all	✗	✗	✗	✗	Jupiter

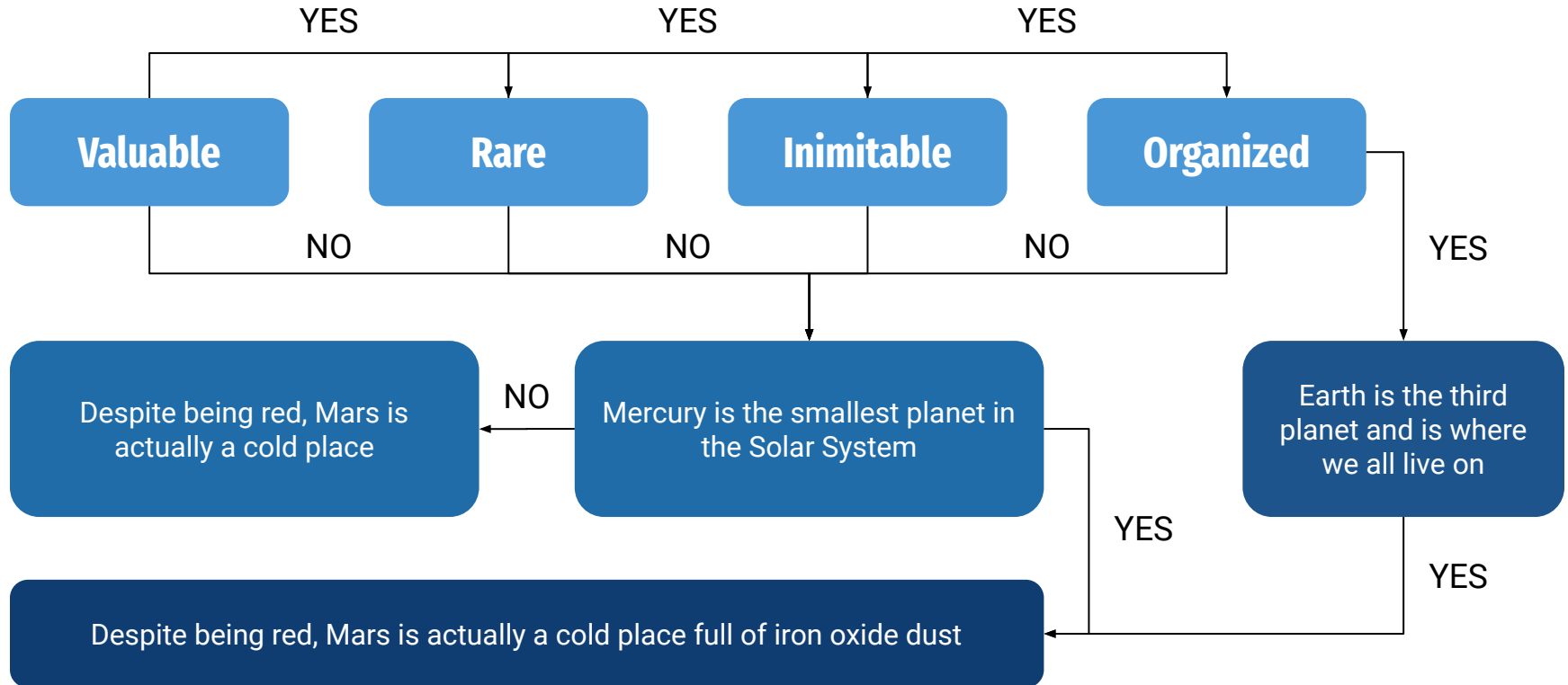
VRIO Analysis Infographics



VRIO Analysis Infographics



VRIO Analysis Infographics



VRIO Analysis Infographics

	Valuable	Rare	Inimitable	Organized	Implications	Performance
Competency 1	Y	-	-	Y	Venus is terribly hot	Venus
Competency 2	Y	Y	Y	N	Mars a cold place	Mars
Competency 3	N	N	Y	N	It's where we live on	Earth
Competency 4	Y	Y	N	Y	It's the biggest planet	Jupiter
Competency 5	-	Y	Y	-	It's the smallest planet	Mercury
Competency 6	Y	N	-	Y	Saturn has several rings	Saturn

VRIO Analysis Infographics

	Valuable	Rare	Inimitable	Organized
Venus is terribly hot, even hotter than Mercury	Done	-	-	Done
Despite being red, Mars is actually a cold place	-	Done	-	-
Jupiter is the biggest planet in the Solar System	-	Done	Done	-
Earth is the only planet that harbors life	Done	Done	-	Done
Mercury is the smallest planet in the Solar System	-	-	Done	-

VRIO Analysis Infographics

Competitive advantage	Valuable	Rare	Inimitable	Organized
Mercury is a small planet	✗	✗	✗	✗
Jupiter is the biggest planet	✓	✗	✗	✗
Earth is where we all live on	✓	✓	✗	✗
Mars is actually a cold place	✓	✓	✓	✗
Venus is hotter than Mercury	✓	✓	✓	✓
	Earth	Venus	Jupiter	Saturn

VRIO Analysis Infographics



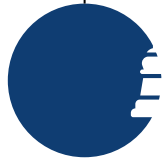
Mercury is the closest planet to the Sun and the smallest one

Valuable

Venus has a beautiful name, but also high temperatures

Rare

Jupiter is a gas giant and the biggest planet of them all



Saturn is composed mostly of hydrogen and helium



Inimitable

Pluto used to be the ninth planet from the Sun

Organized

Neptune is the fourth-largest planet in the Solar System

Despite being red, Mars is actually a cold place full of iron oxide dust








Earth is the third planet from the Sun and the only one that harbors life

VRIO Analysis Infographics

V Valuable	R Rare	I Inimitable	O Organized	? Result?
-	Done	-	-	Mercury is the smallest planet
Done	-	Done	-	Earth is where we all live on
Done	-	Done	Done	Neptune is far away from us
-	-	-	-	Mars is actually a cold place
-	Done	-	Done	Saturn has several rings
Done	-	-	Done	Jupiter is the biggest planet
-	-	Done	-	Ceres is in the asteroid belt

VRIO Analysis Infographics

Saturn has several rings	Yes	Yes	Yes	Yes
Earth is where we all live on	Yes	Yes	Yes	No
Mars is actually a cold place	Yes	Yes	No	-
Jupiter is the biggest planet	Yes	No	-	-
Mercury is the smallest planet	No	-	-	-
	Valuable 	Rare 	Inimitable 	Organized 

VRIO Analysis Infographics

Value	Rare	Inimitate	Organized
Venus is terribly hot	Mars is actually cold	Jupiter is a big planet	Earth harbors life
Earth harbors life	Phobos is a moon	Saturn has several rings	Neptune is very far away
Saturn has several rings	Neptune is very far away	Earth harbors life	Mercury is a small planet
Mercury is a small planet	Venus is terribly hot	Mars is actually cold	Phobos is a moon

Competitive advantage

Venus has a beautiful name and is the second planet from the Sun

VRIO Analysis Infographics

Value	Rare	Inimitate	Organized
Venus is terribly hot	Mars is actually cold	Jupiter is a big planet	Earth harbors life
Earth harbors life	Phobos is a moon	Saturn has several rings	Neptune is very far away
Saturn has several rings	Neptune is very far away	Earth harbors life	Mercury is a small planet
Mercury is a small planet	Venus is terribly hot	Mars is actually cold	Phobos is a moon

EPP

Venus has a beautiful name and is
the second planet from the Sun

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