



Mark **Raben**  
CTO, MEE

# **Machine** Learning guide to the Intelligent **Enterprise**













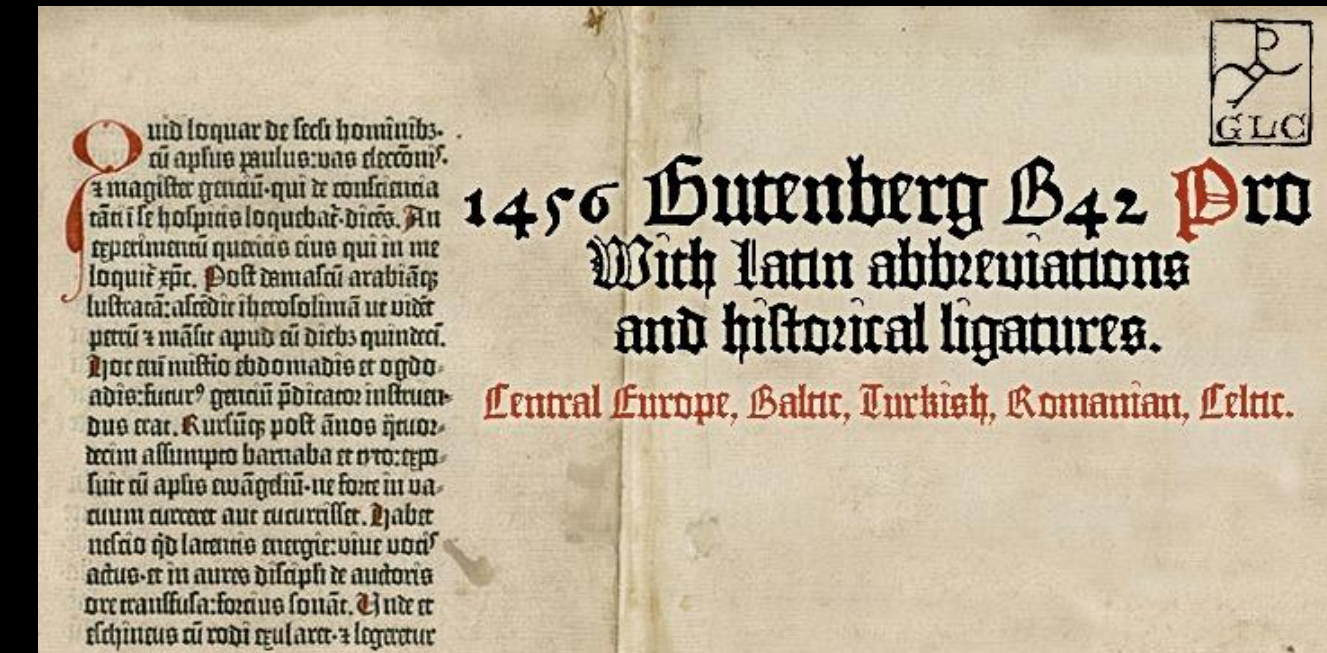
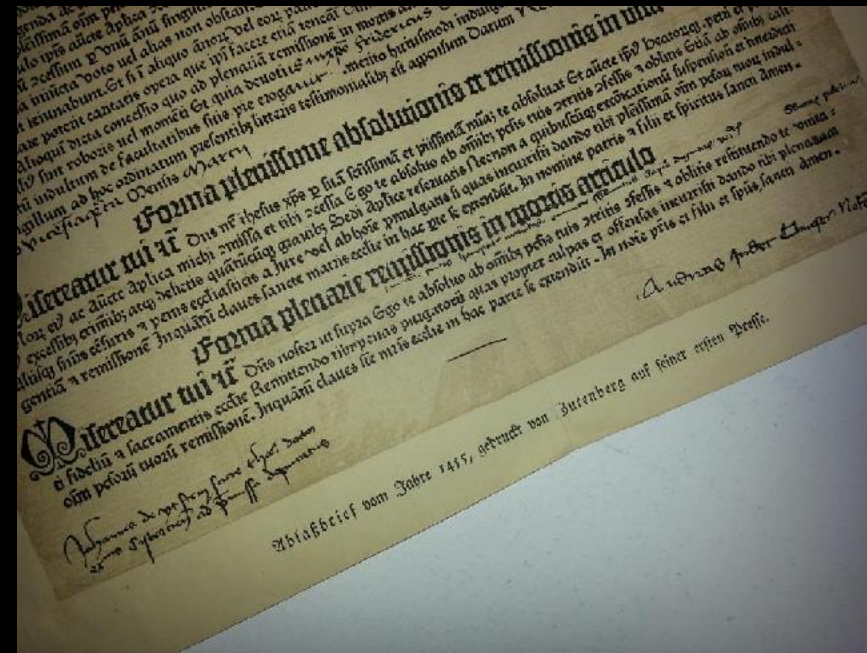
[marcus.raben@sap.com](mailto:marcus.raben@sap.com)  
[@markraben](#)







# APPLICATIONS



# INTELLIGENT TECHNOLOGIES



# FUNDAMENT





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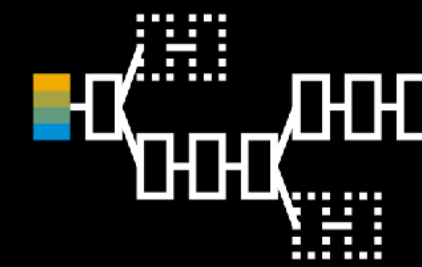
# INTELLIGENT TECHNOLOGIES



IOT



Machine  
Learning



Blockchain



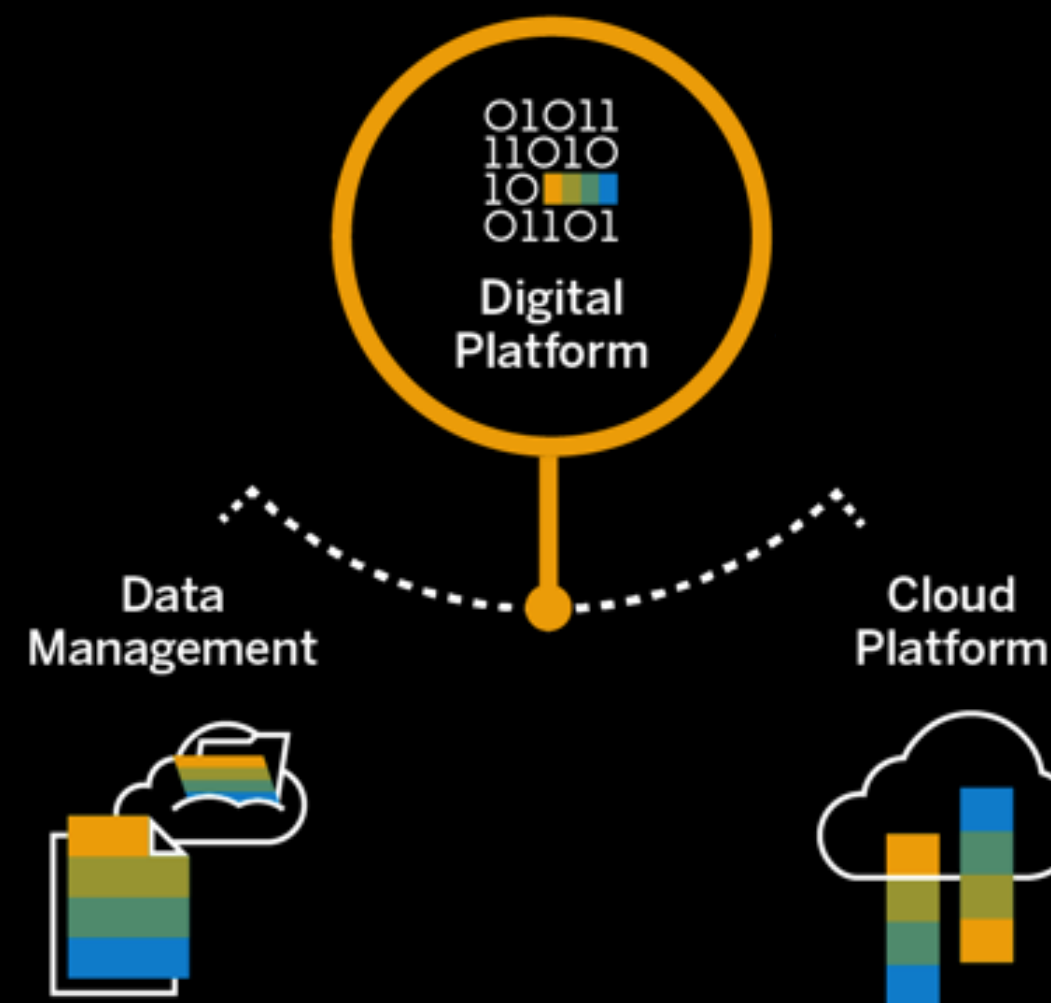
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# INTELLIGENT TECHNOLOGIES



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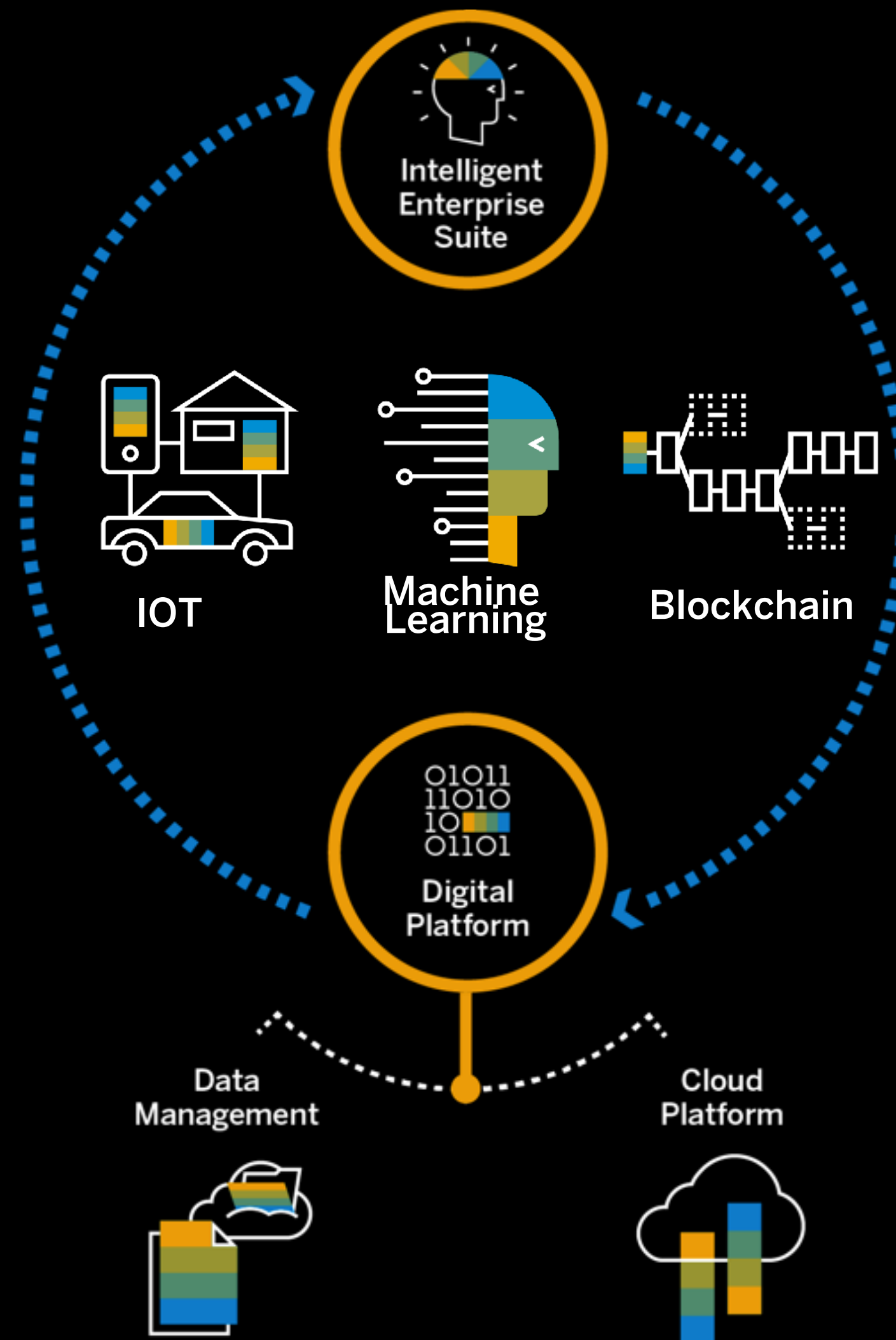
# FUNDAMENT





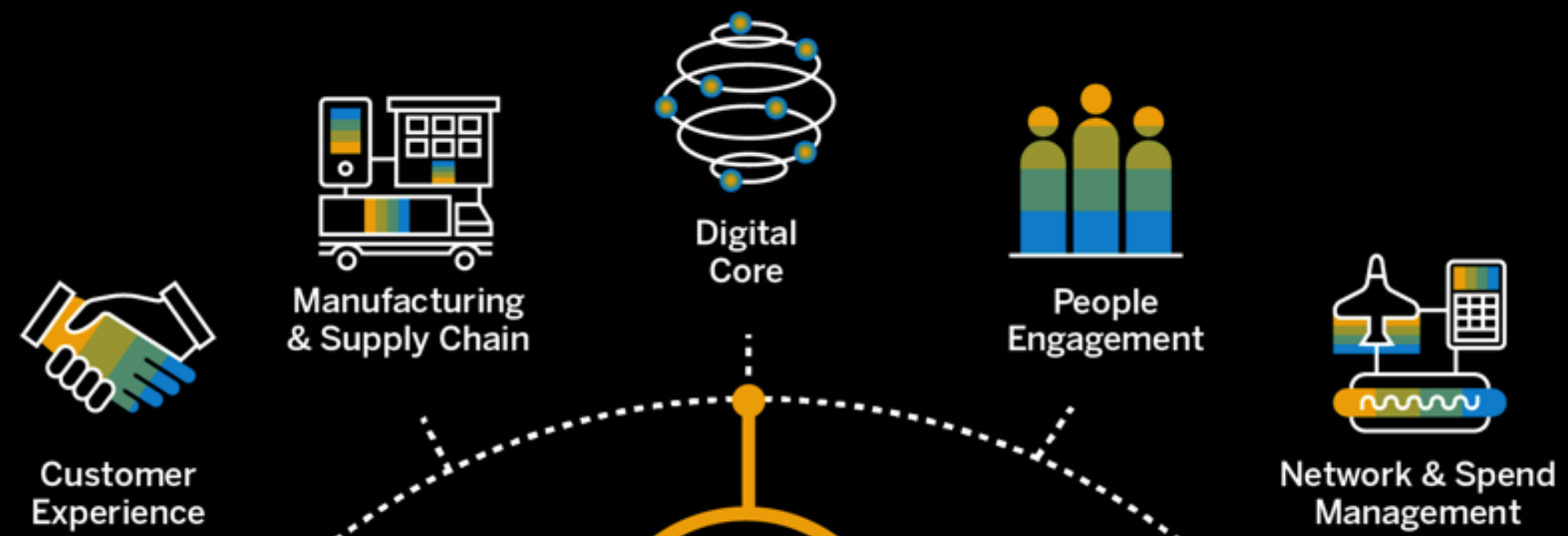
INTELLIGENT  
TECHNOLOGIES

FUNDAMENT

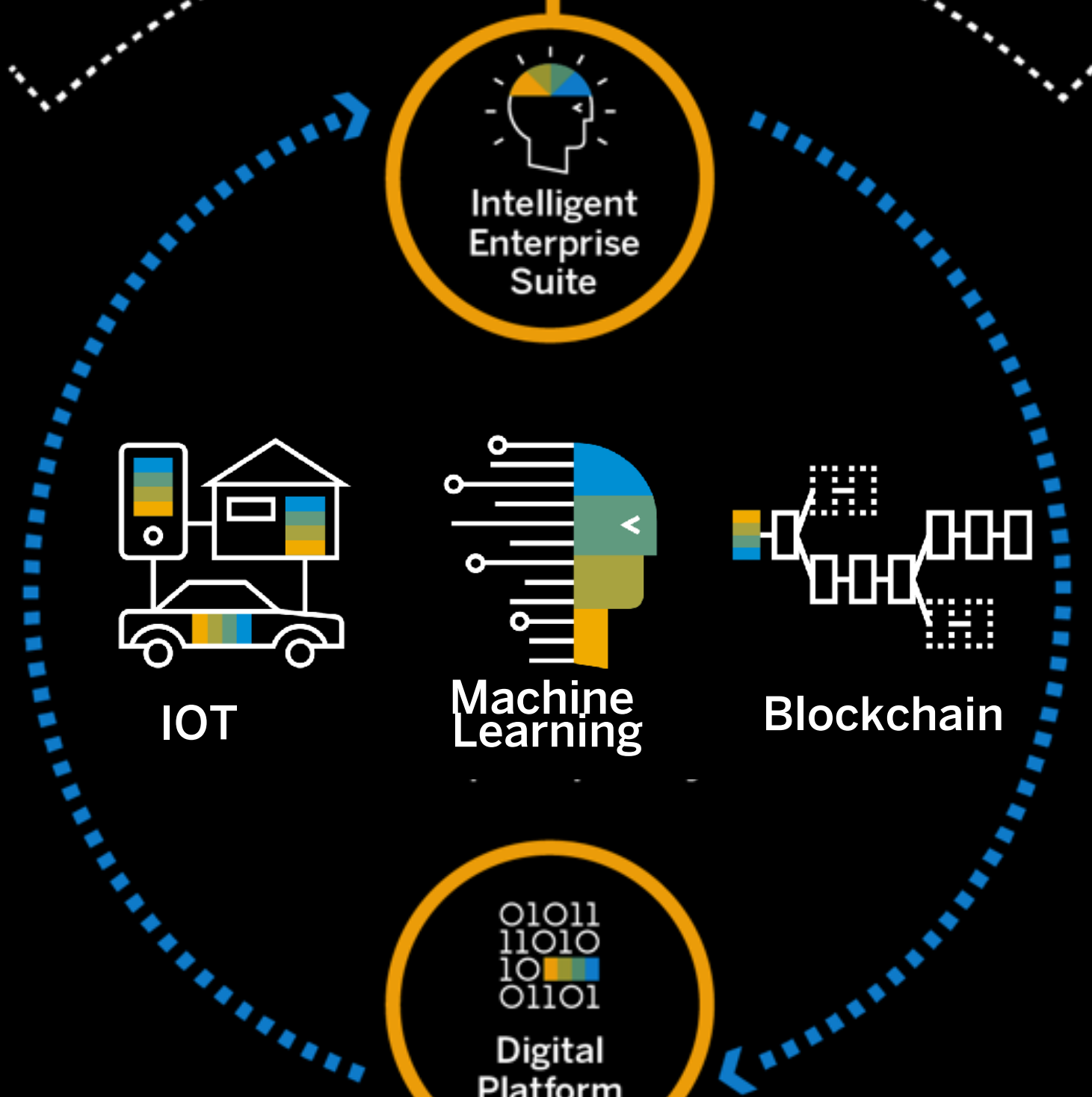




# APPLICATIONS



# INTELLIGENT TECHNOLOGIES



# FUNDAMENT





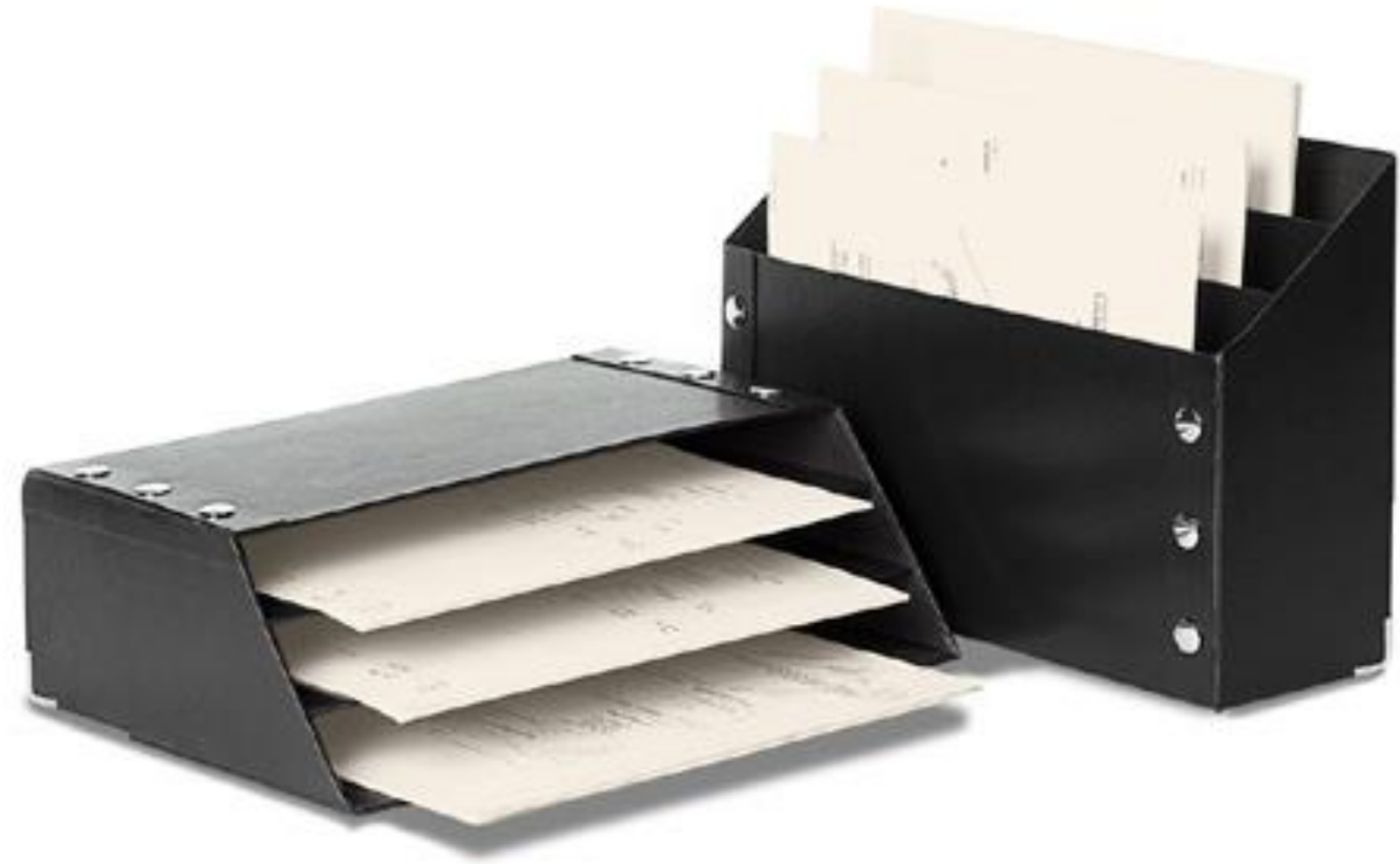
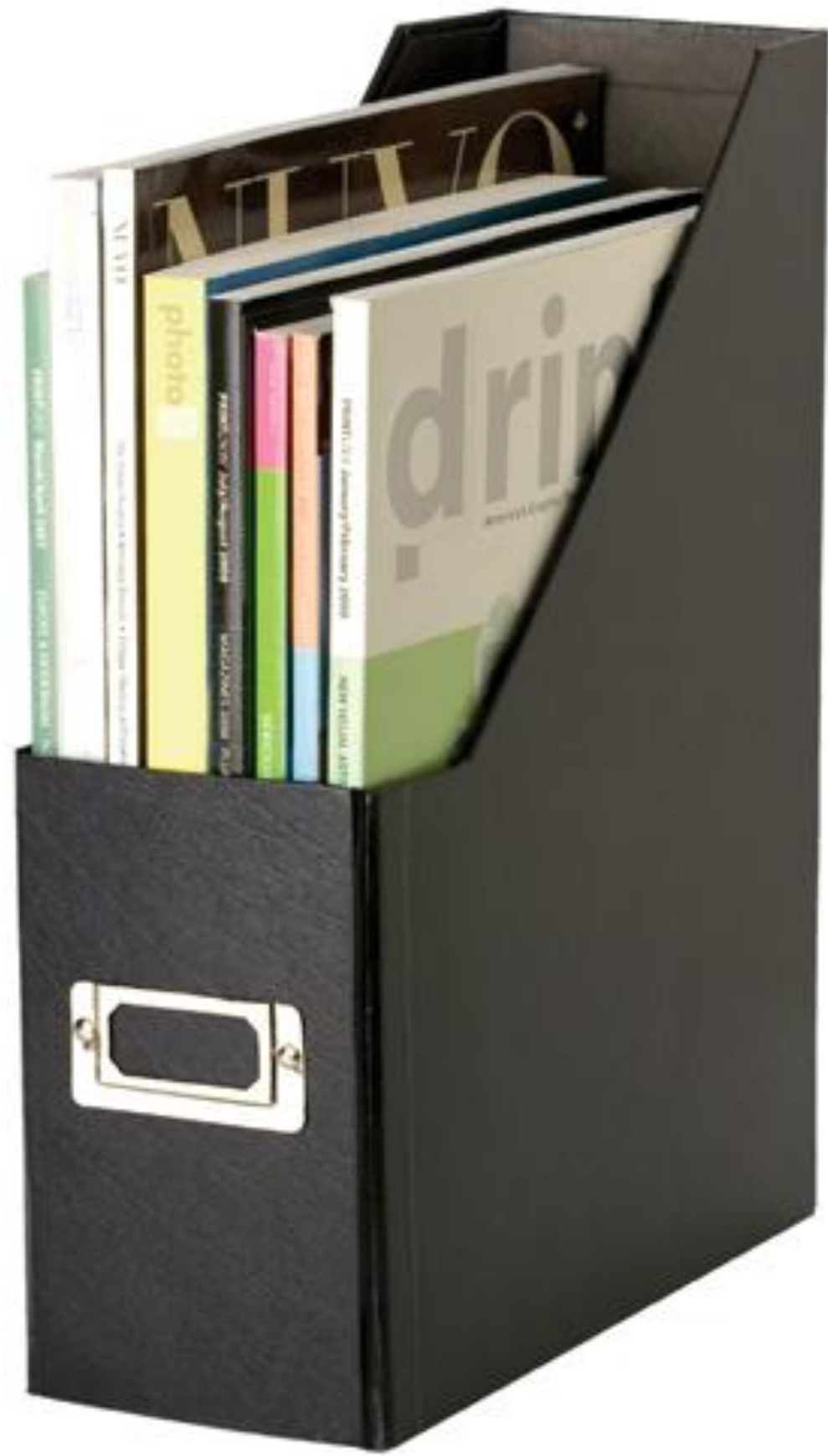
APPLICATIONS

INTELLIGENT  
TECHNOLOGIES

FUNDAMENT

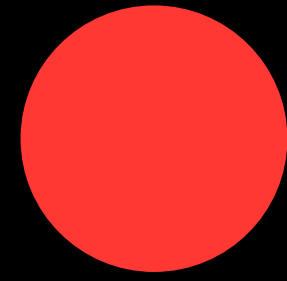








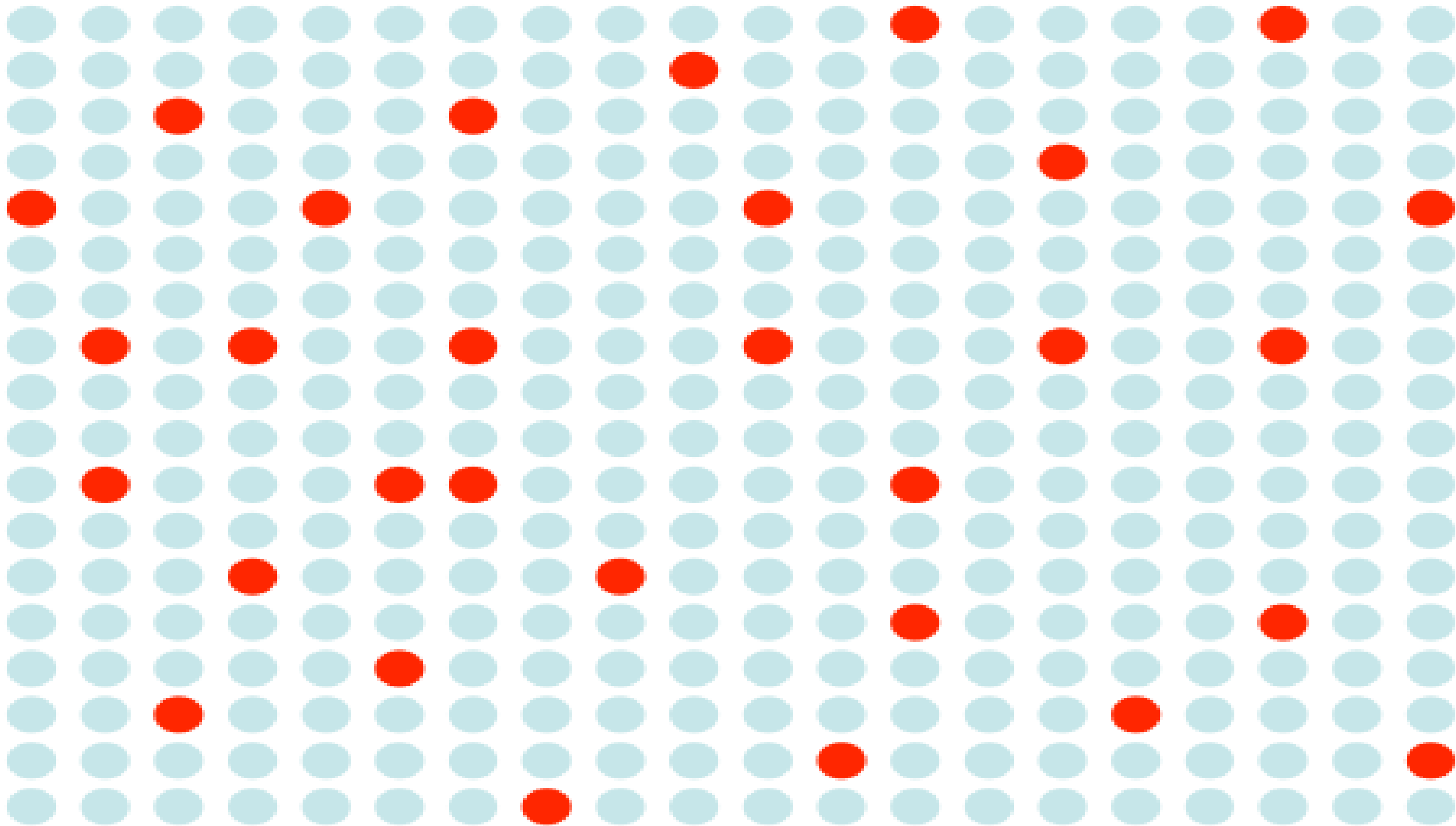
How many **red**



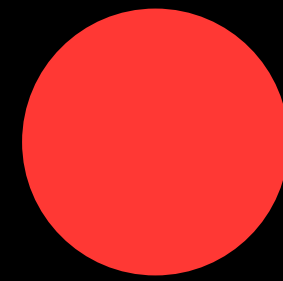
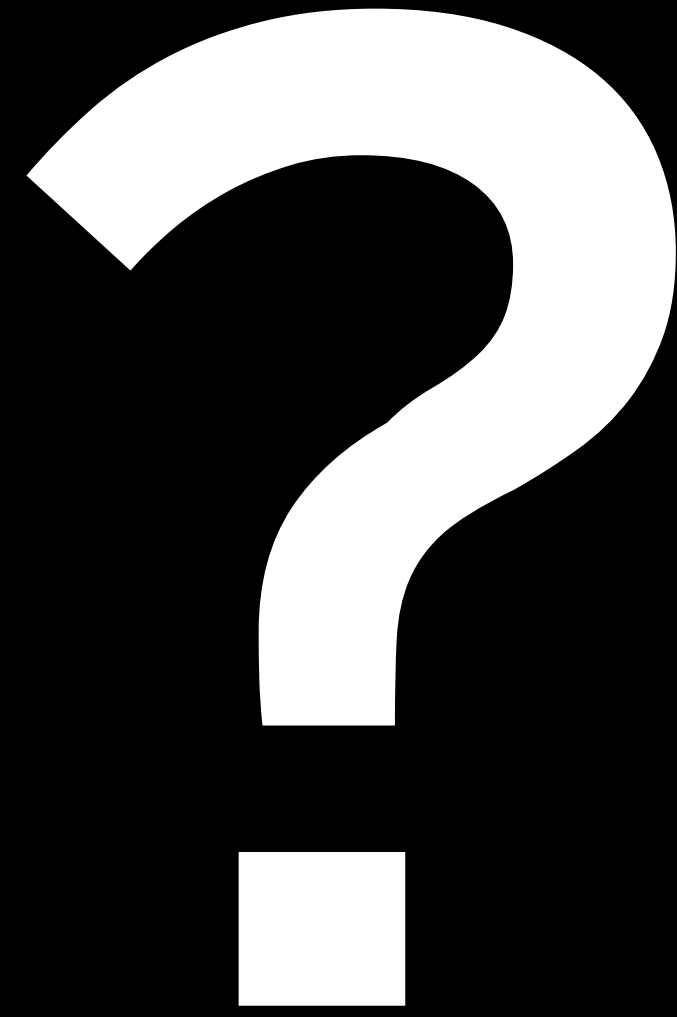
do you see?

You'll get 2 sec



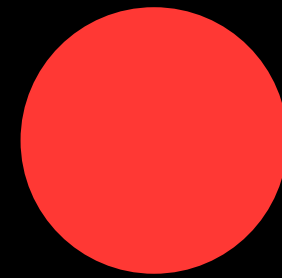




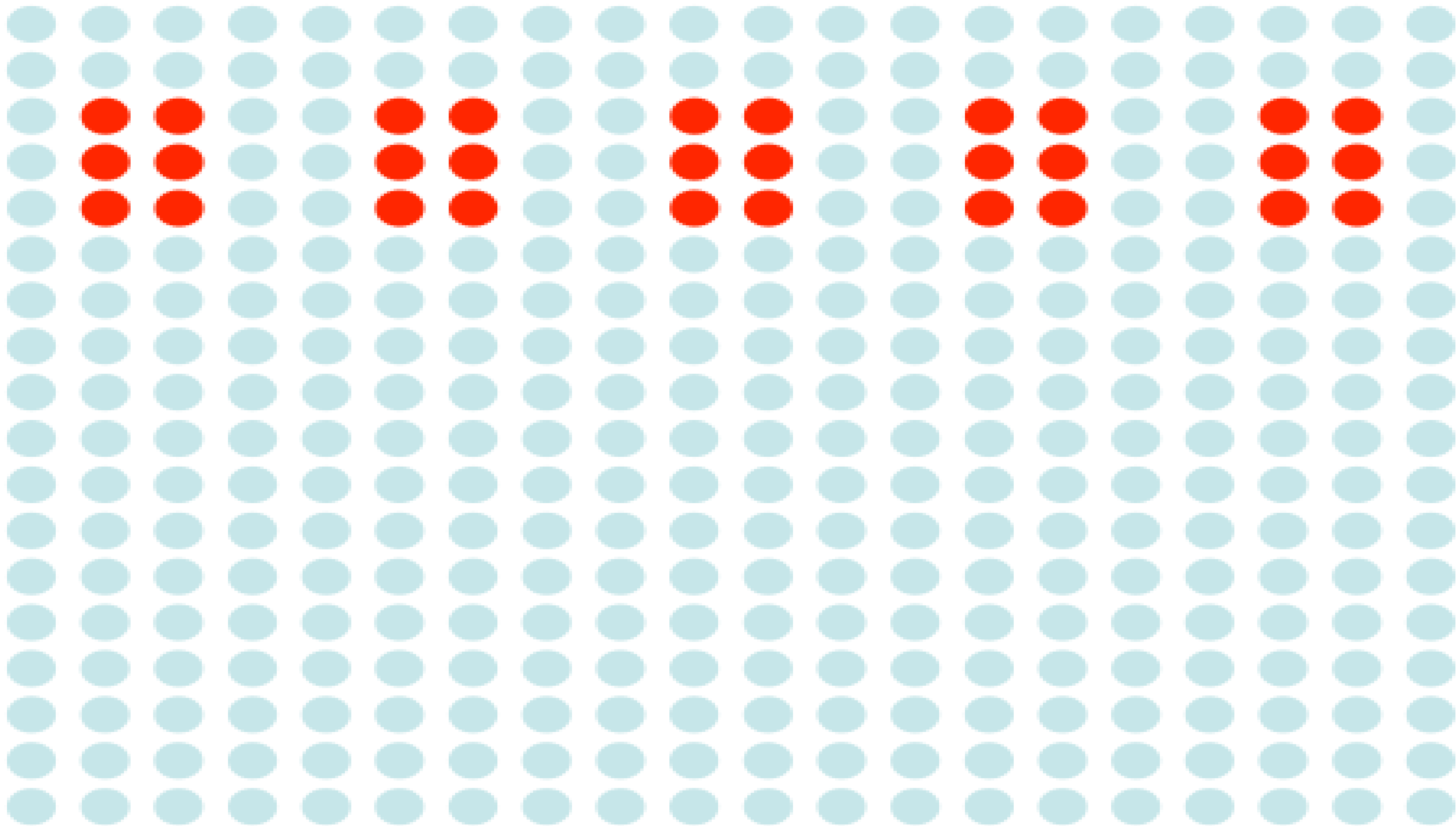




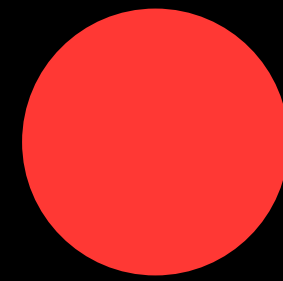
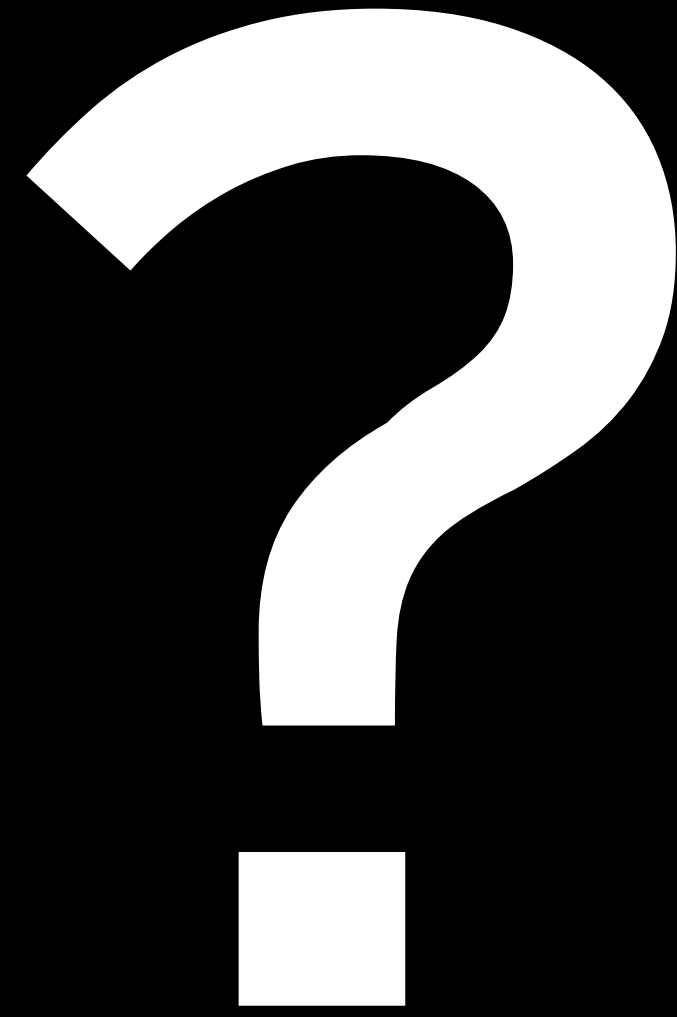
One again ...?













APPLICATIONS

INTELLIGENT  
TECHNOLOGIES

FUNDAMENT





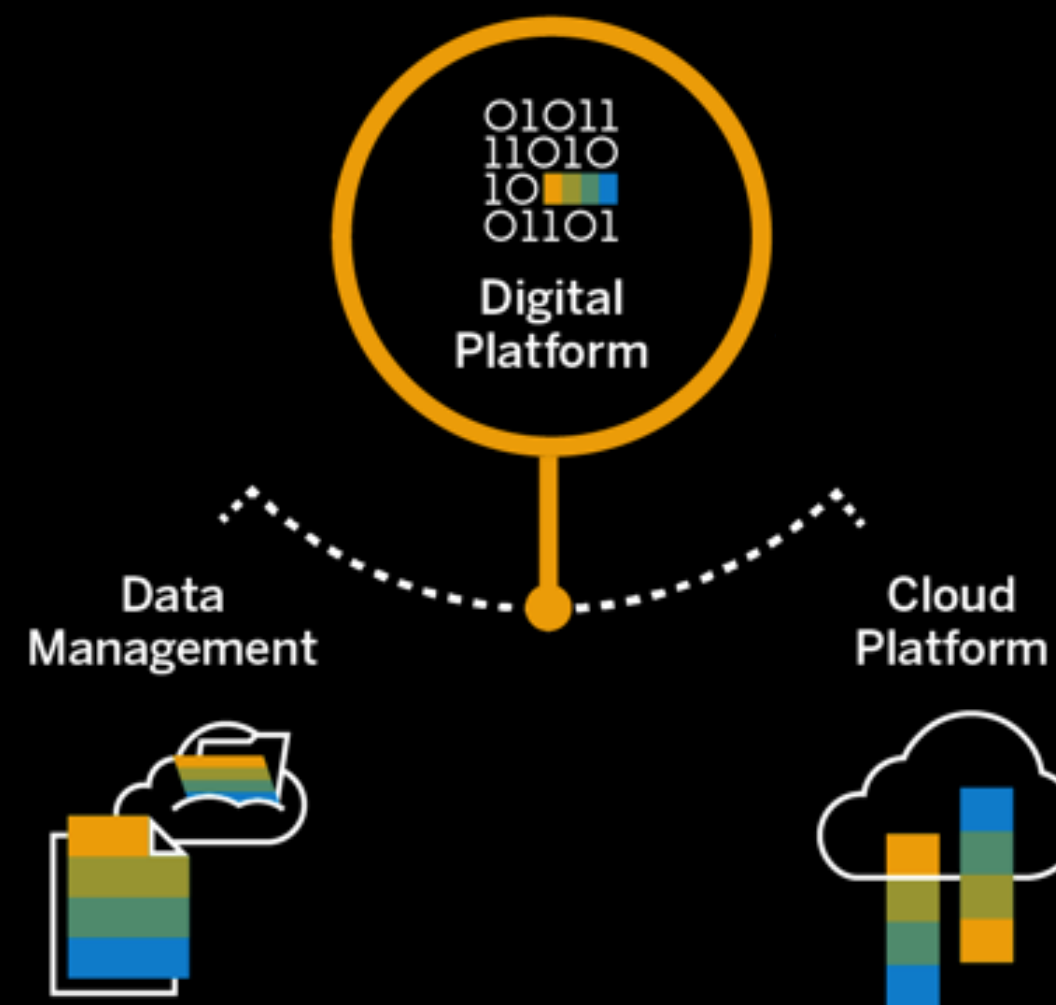
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# INTELLIGENT TECHNOLOGIES

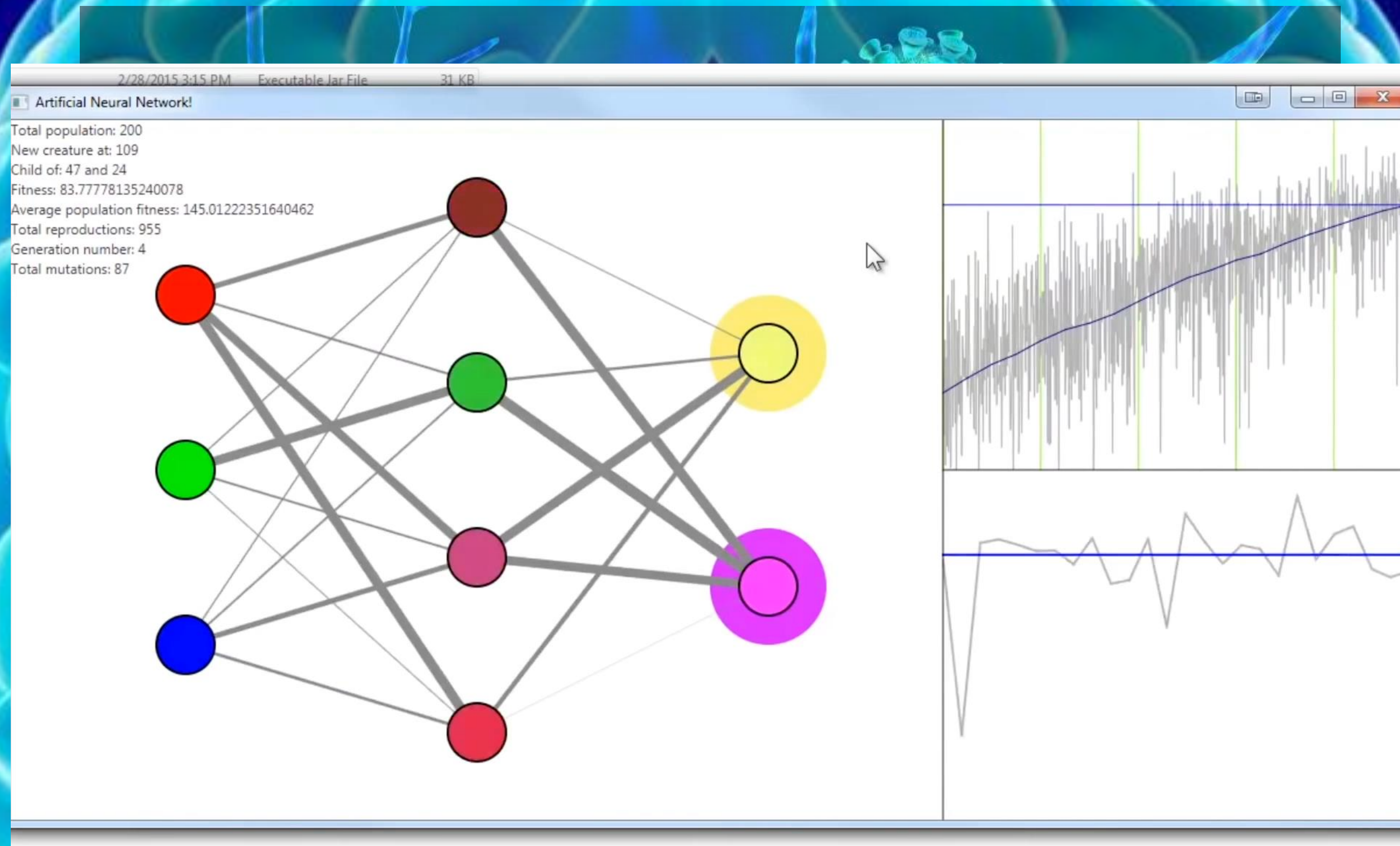


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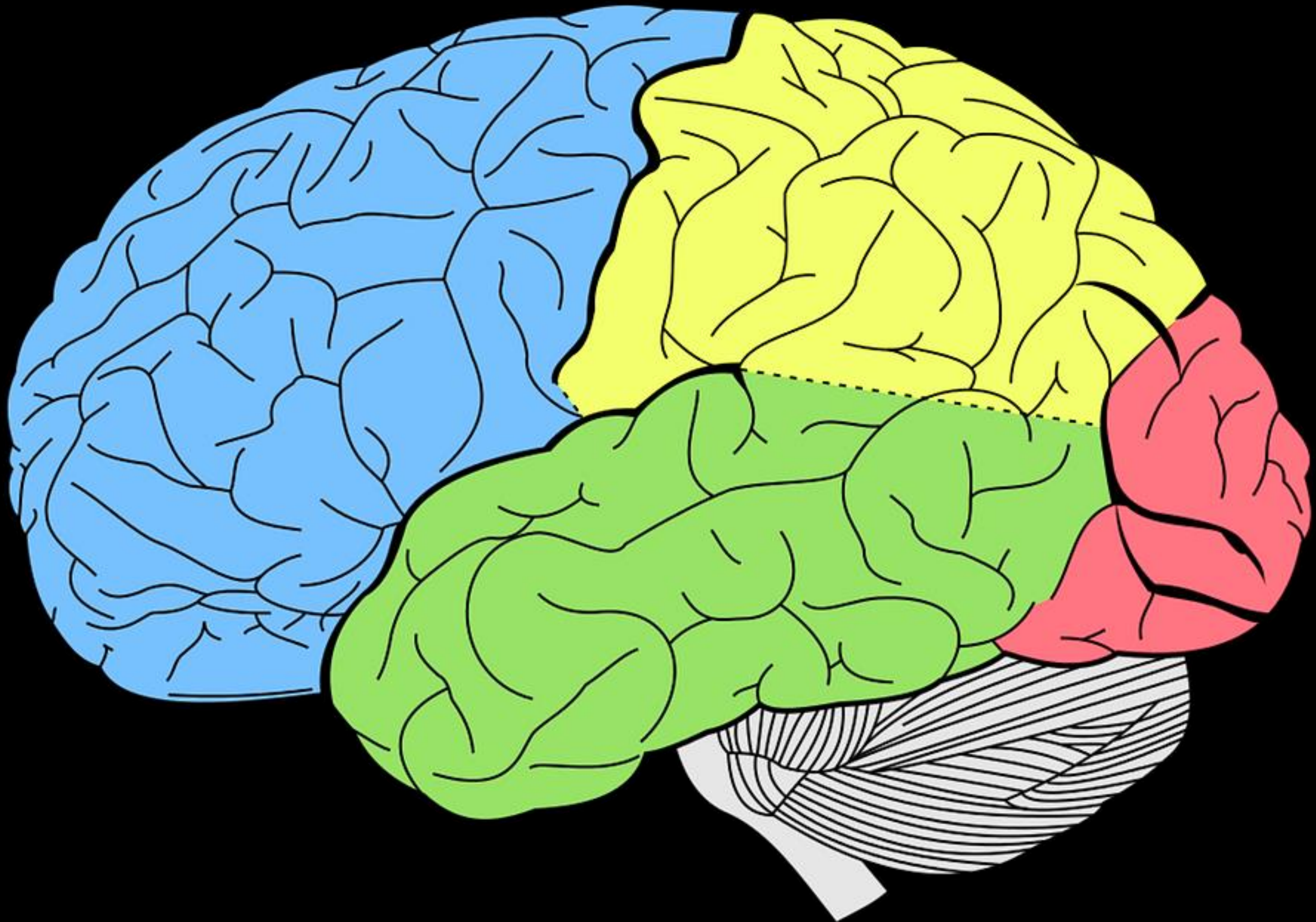
# FUNDAMENT



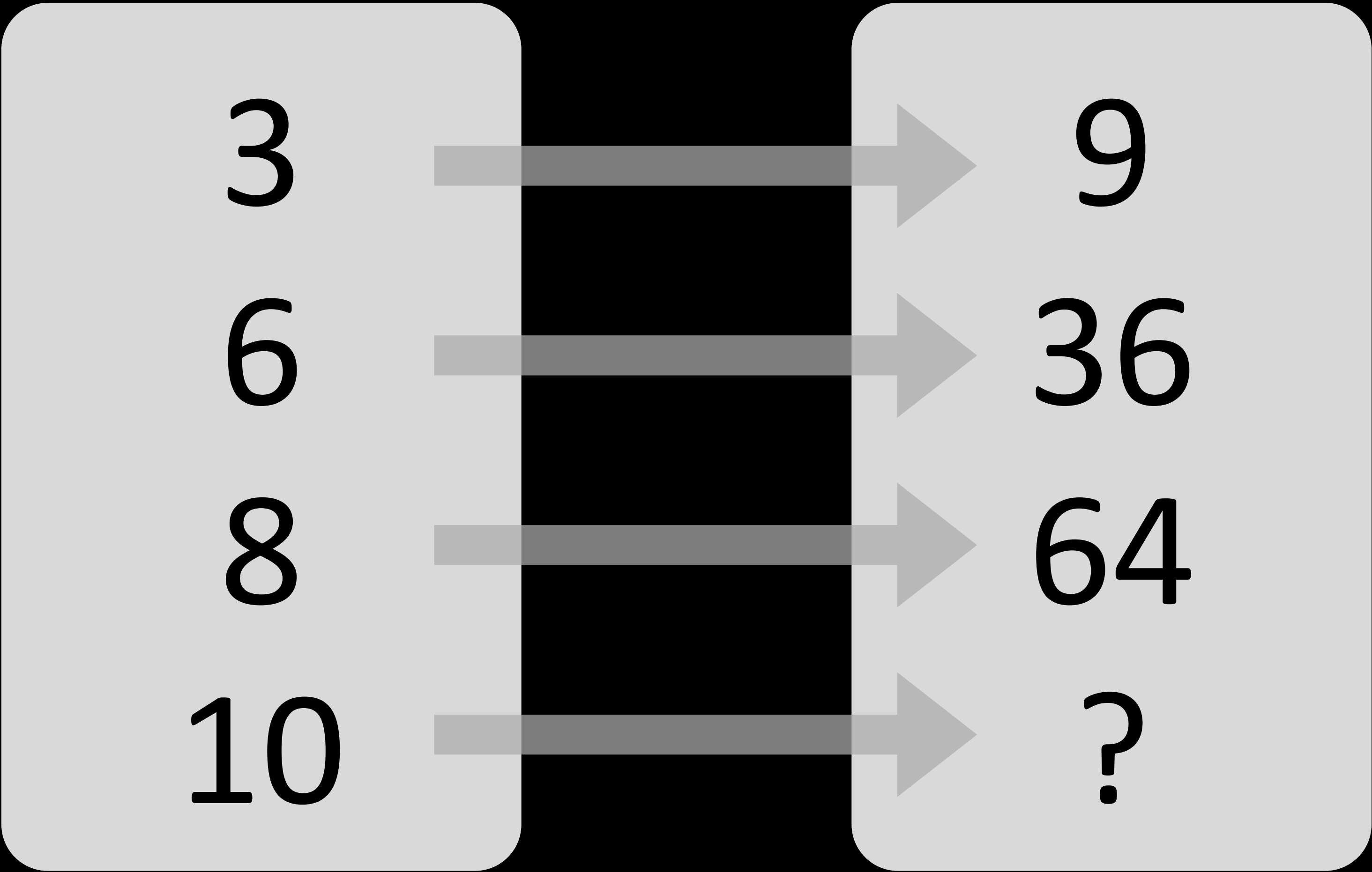










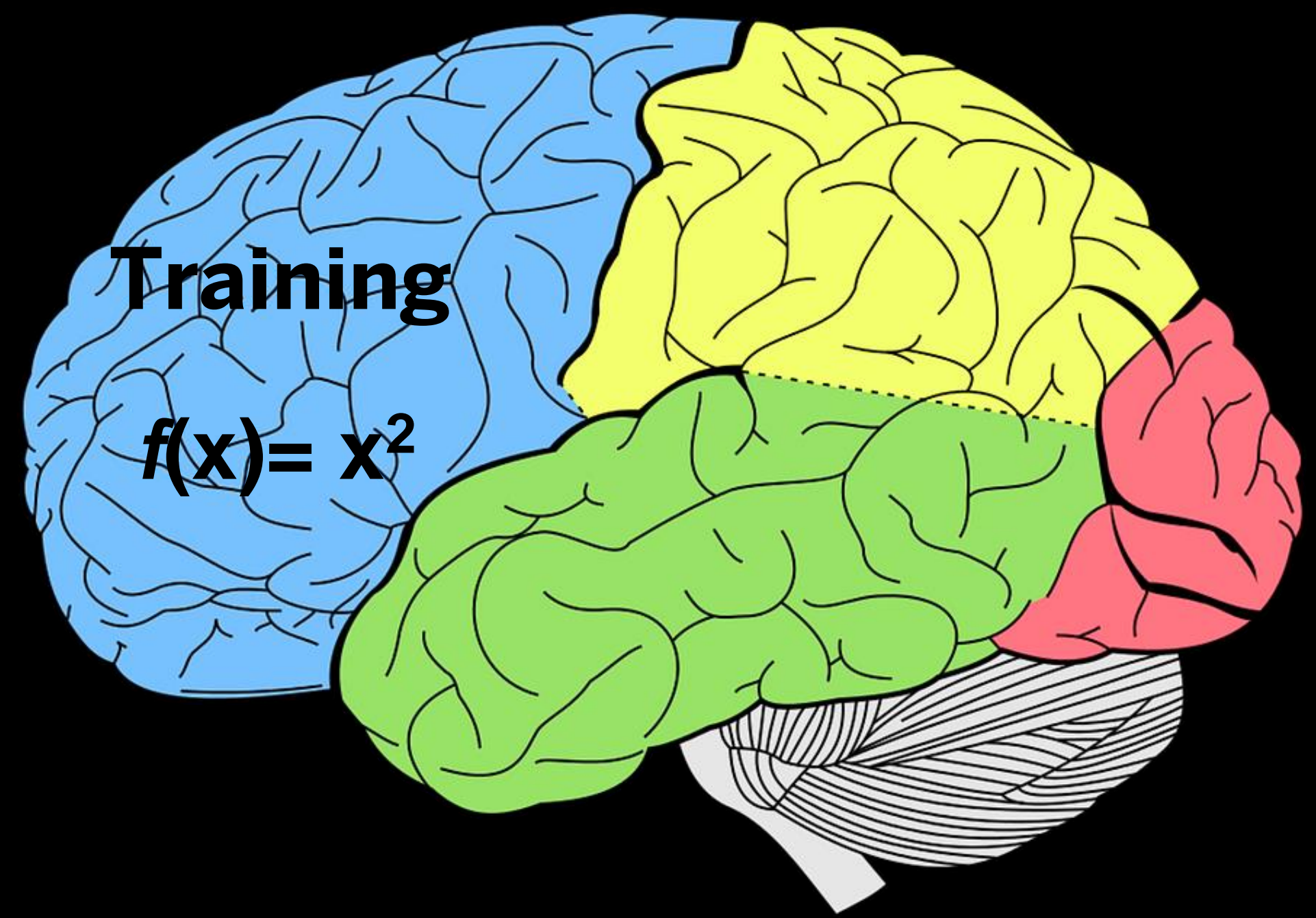






**Inputs**

- 3
- 6
- 8



**Outputs**

- 9
- 36
- 64



## Inputs

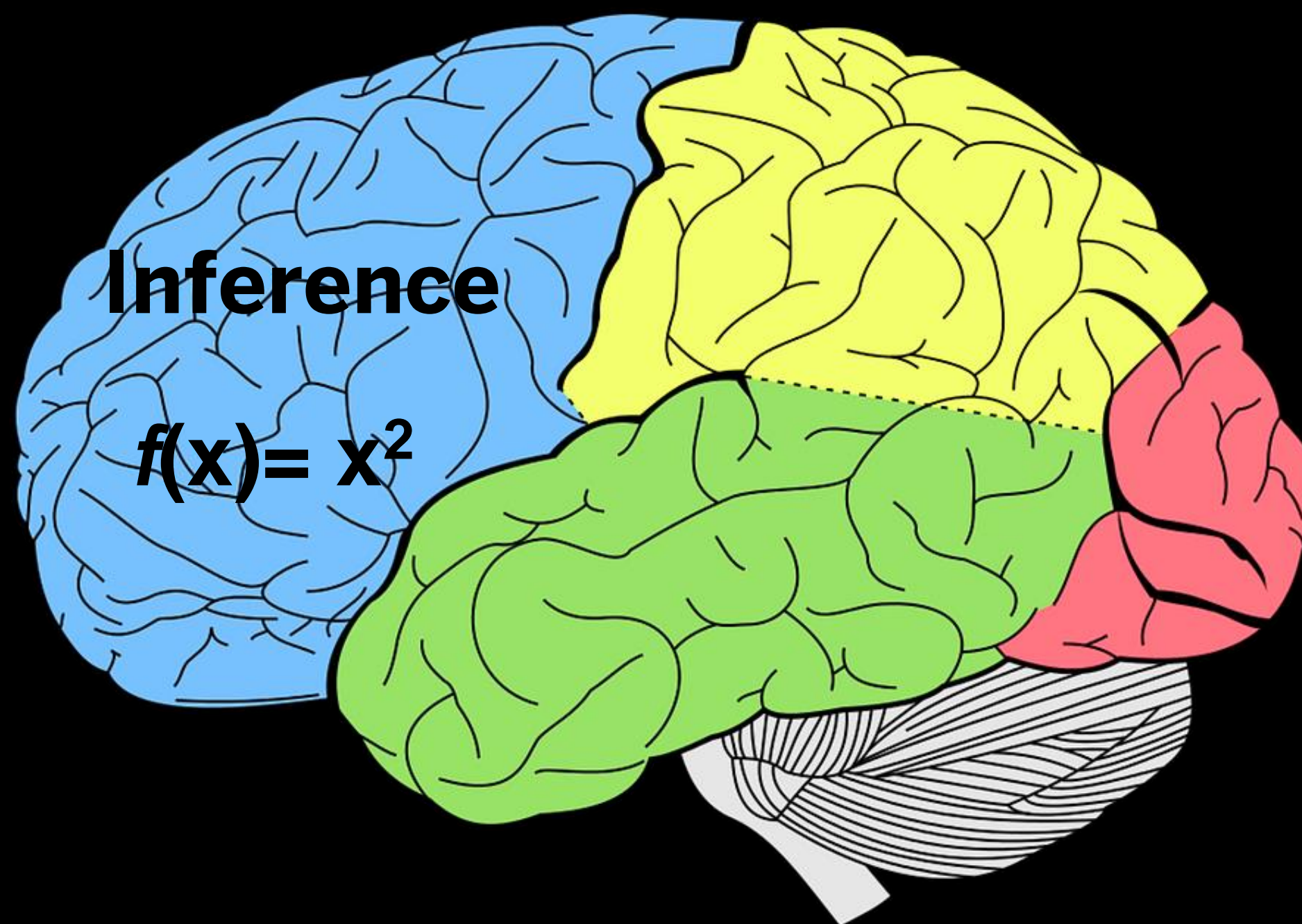
- 3
- 6
- 8

## Inference

$$f(x) = x^2$$

## Outputs

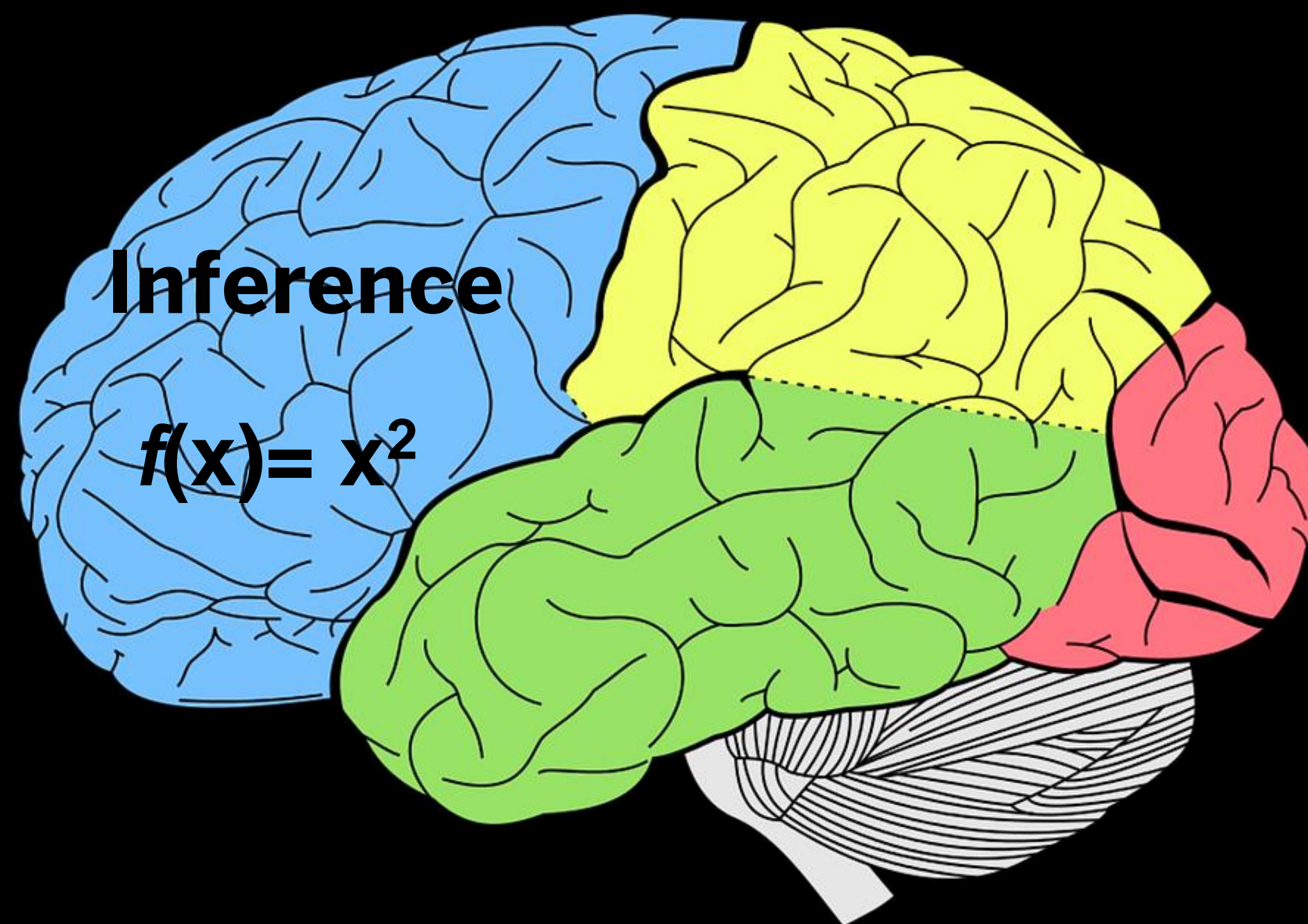
- 9
- 36
- 64





## Inputs

- 3
- 6
- 8
- 10



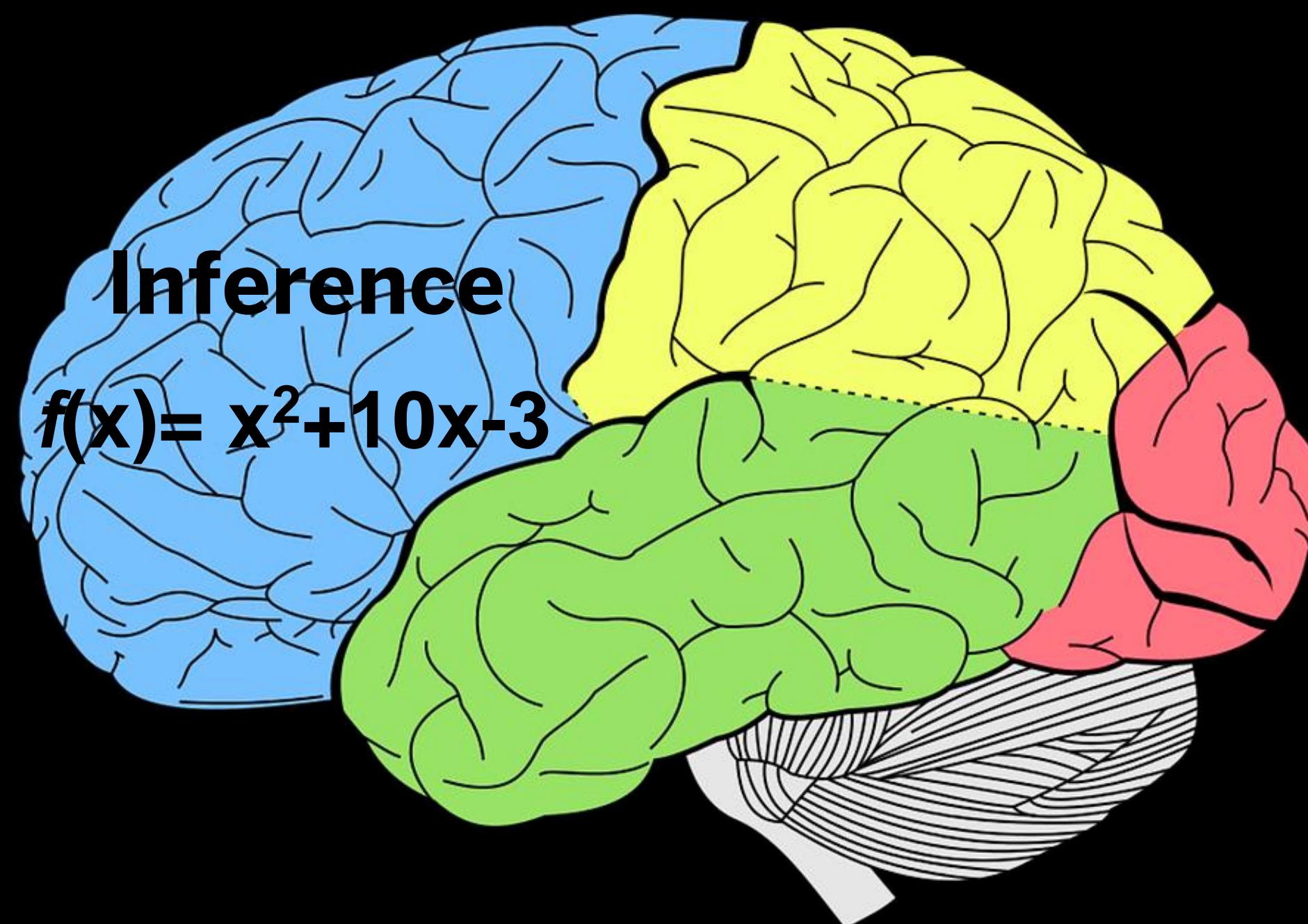
## Outputs

- 9
- 36
- 64
- 100



## Inputs

- 3
- 6
- 8
- 10

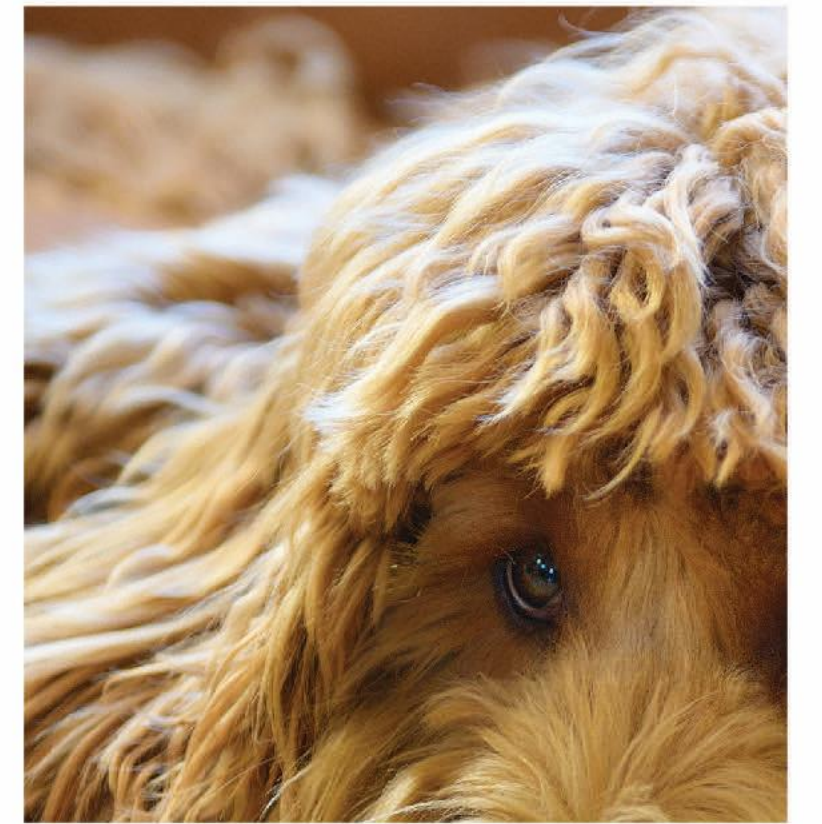
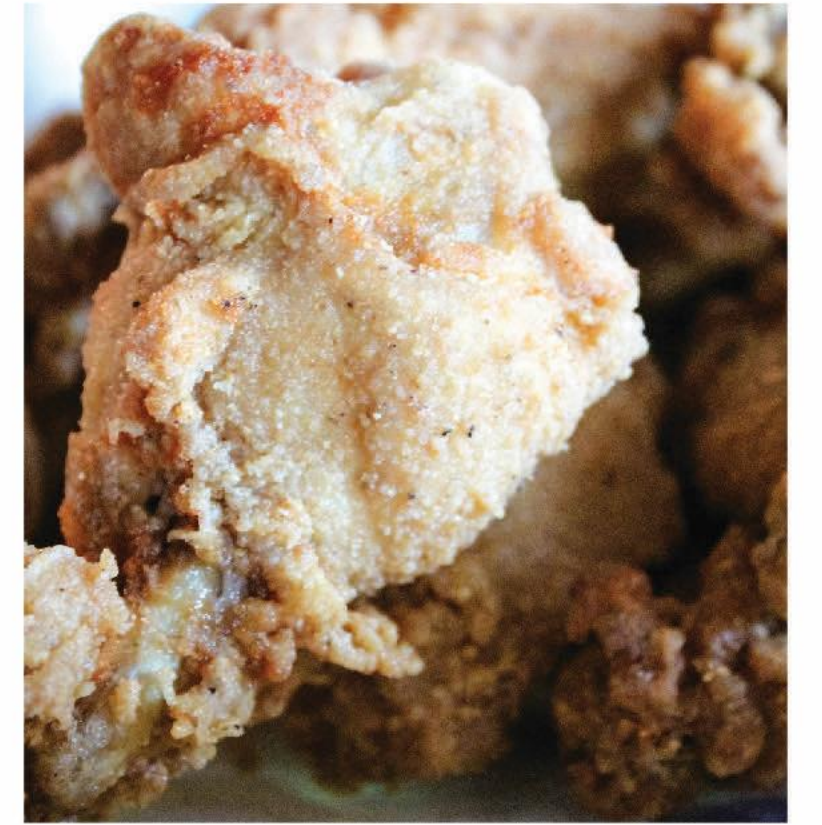


## Outputs

- 36
- 93
- 141
- 197



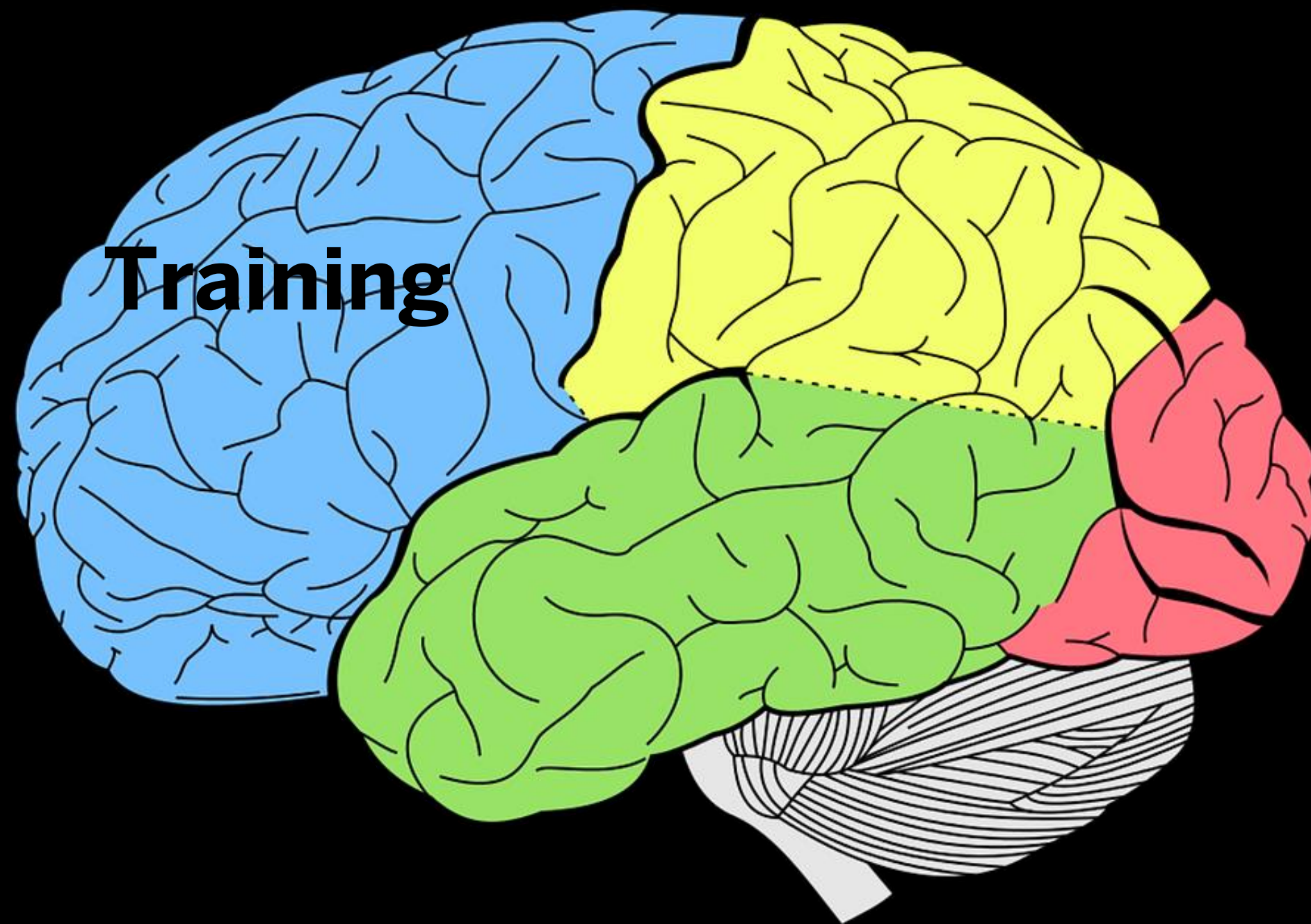
**Labradoodle  
or fried chicken?**







**Inputs**



**Outputs**





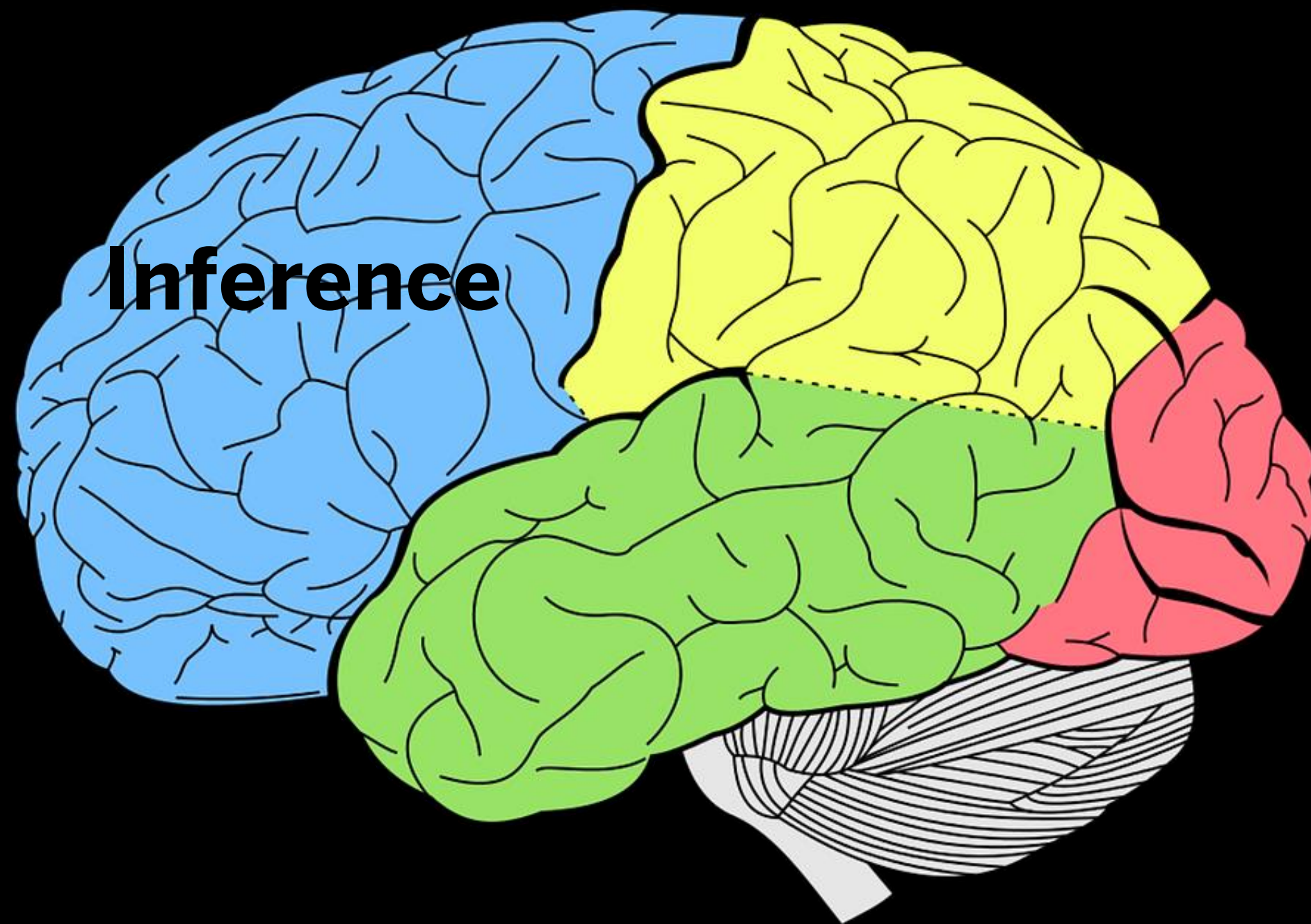
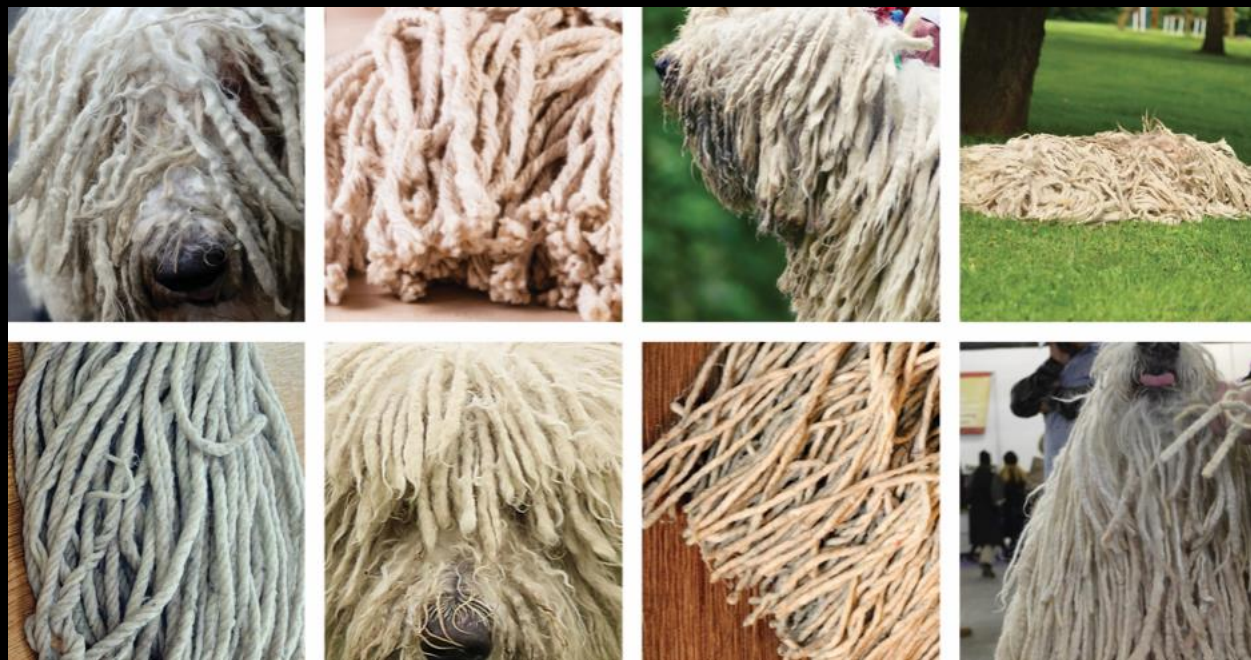


**Sheepdog  
or mop?**





**Inputs**



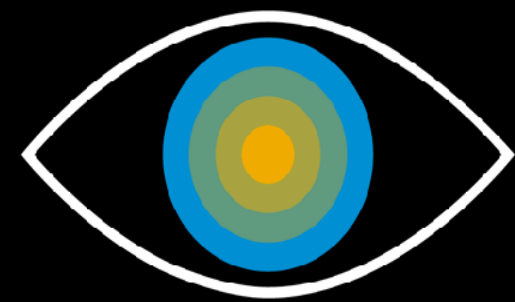
**Outputs**





# Machine Learning enables computers to:

## See



OCR  
Image classification  
Face detection  
Emotion recognition

## Read & Write



Topic detection  
Translation  
Text feature extraction  
Sentiment analysis

## Speak, Listen, Converse



Speech-to-text  
Text-to-speech  
Natural-language chatbots

## Predict & Find Patterns



Recommendation engine  
Classification  
Anomaly detection  
Forecasting  
Matching & proposals



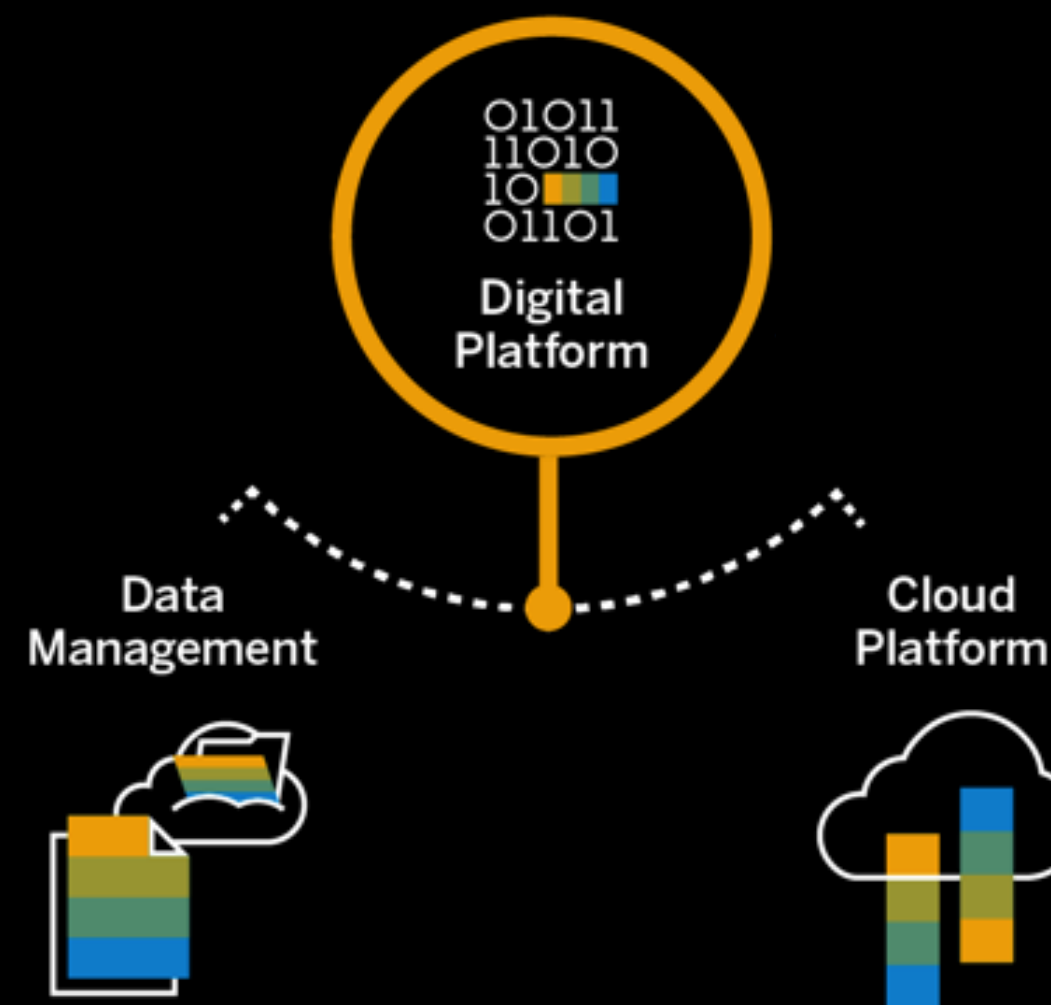
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# INTELLIGENT TECHNOLOGIES



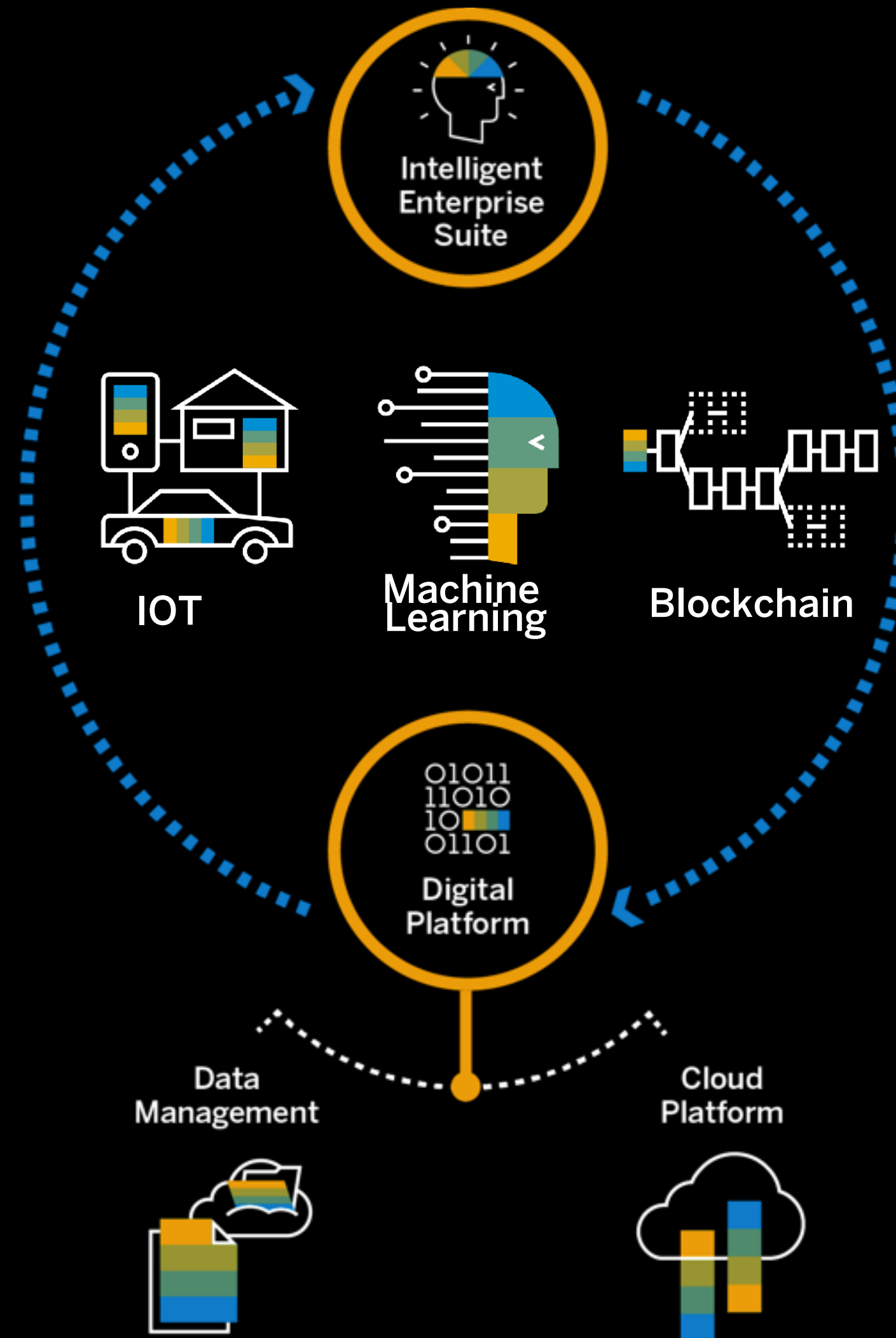
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# FUNDAMENT





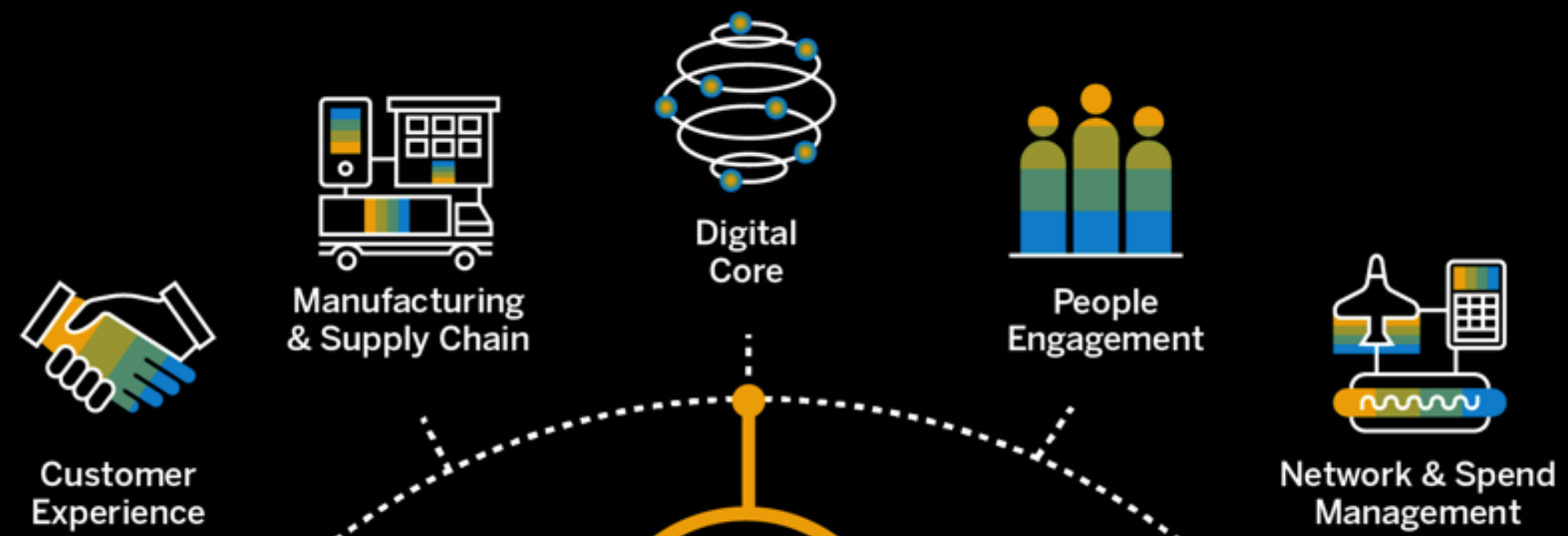
INTELLIGENT  
TECHNOLOGIES



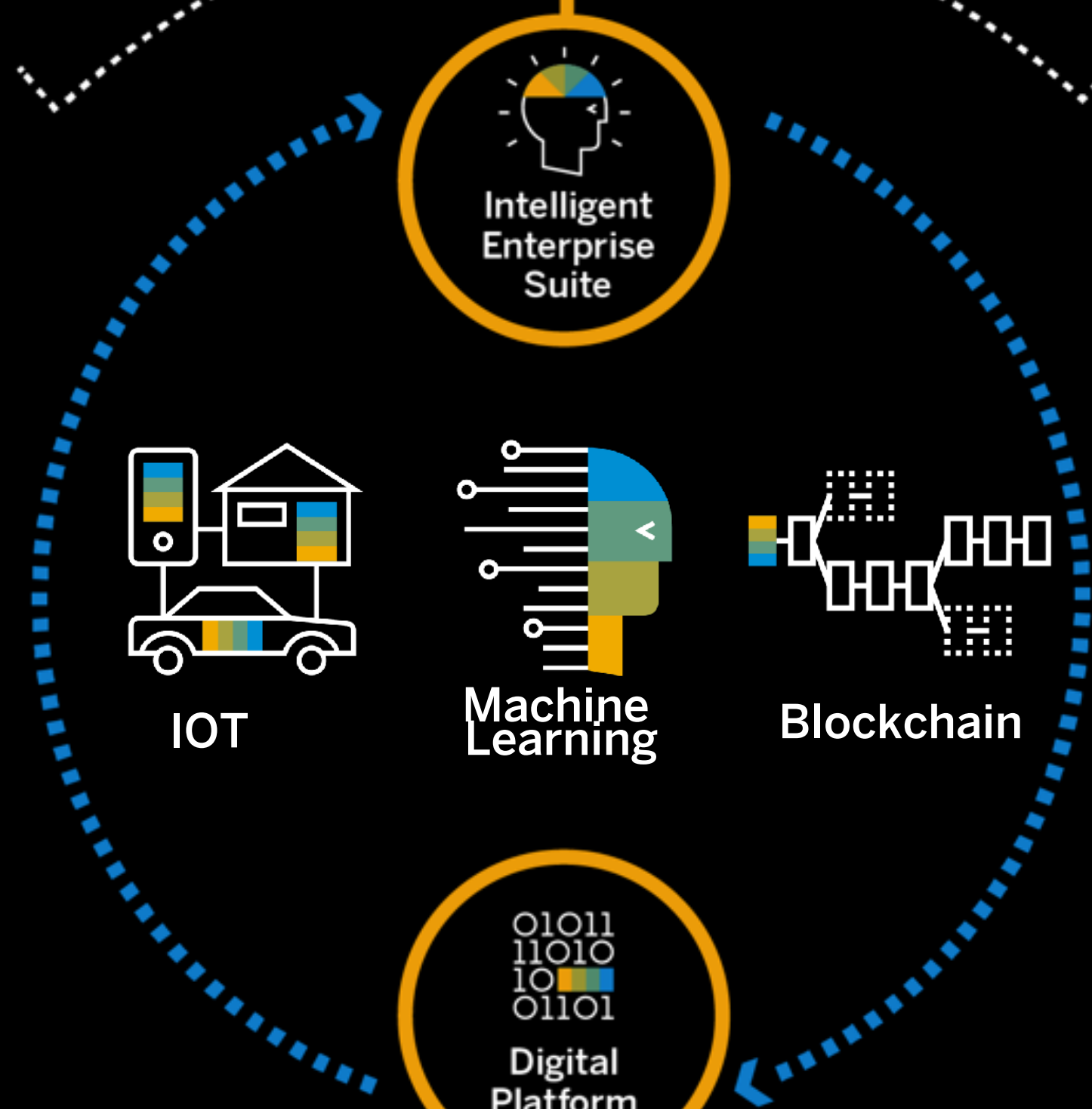
FUNDAMENT



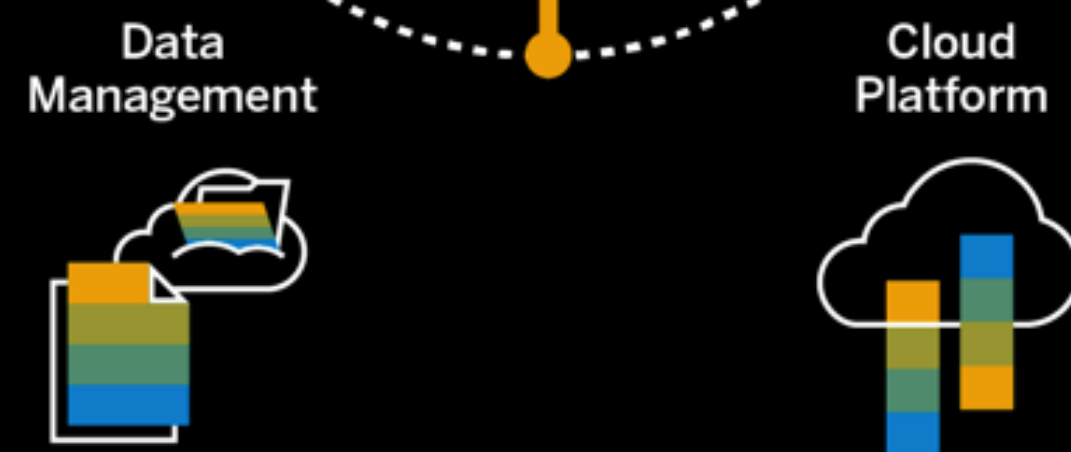
# APPLICATIONS



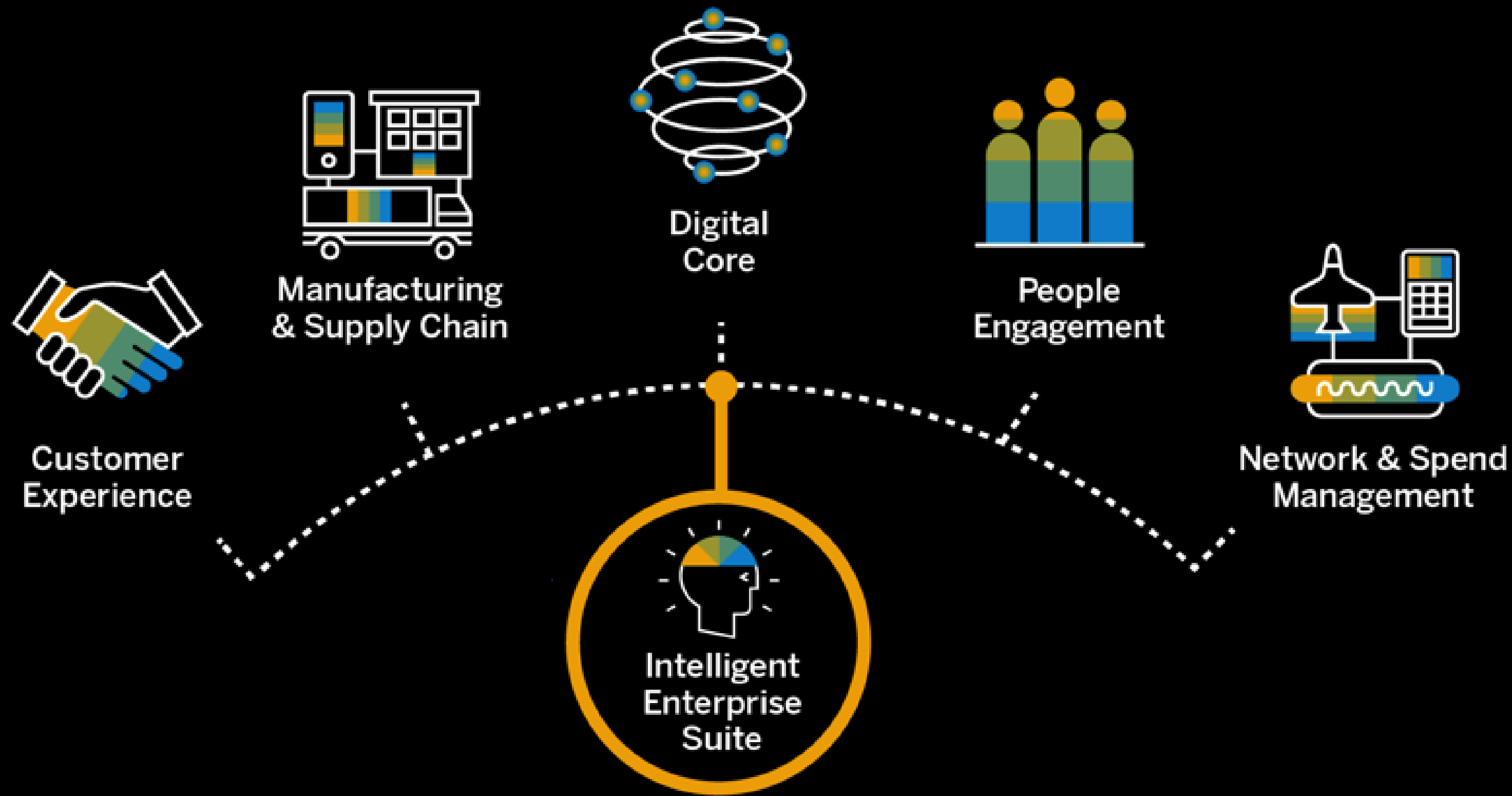
# INTELLIGENT TECHNOLOGIES



# FUNDAMENT





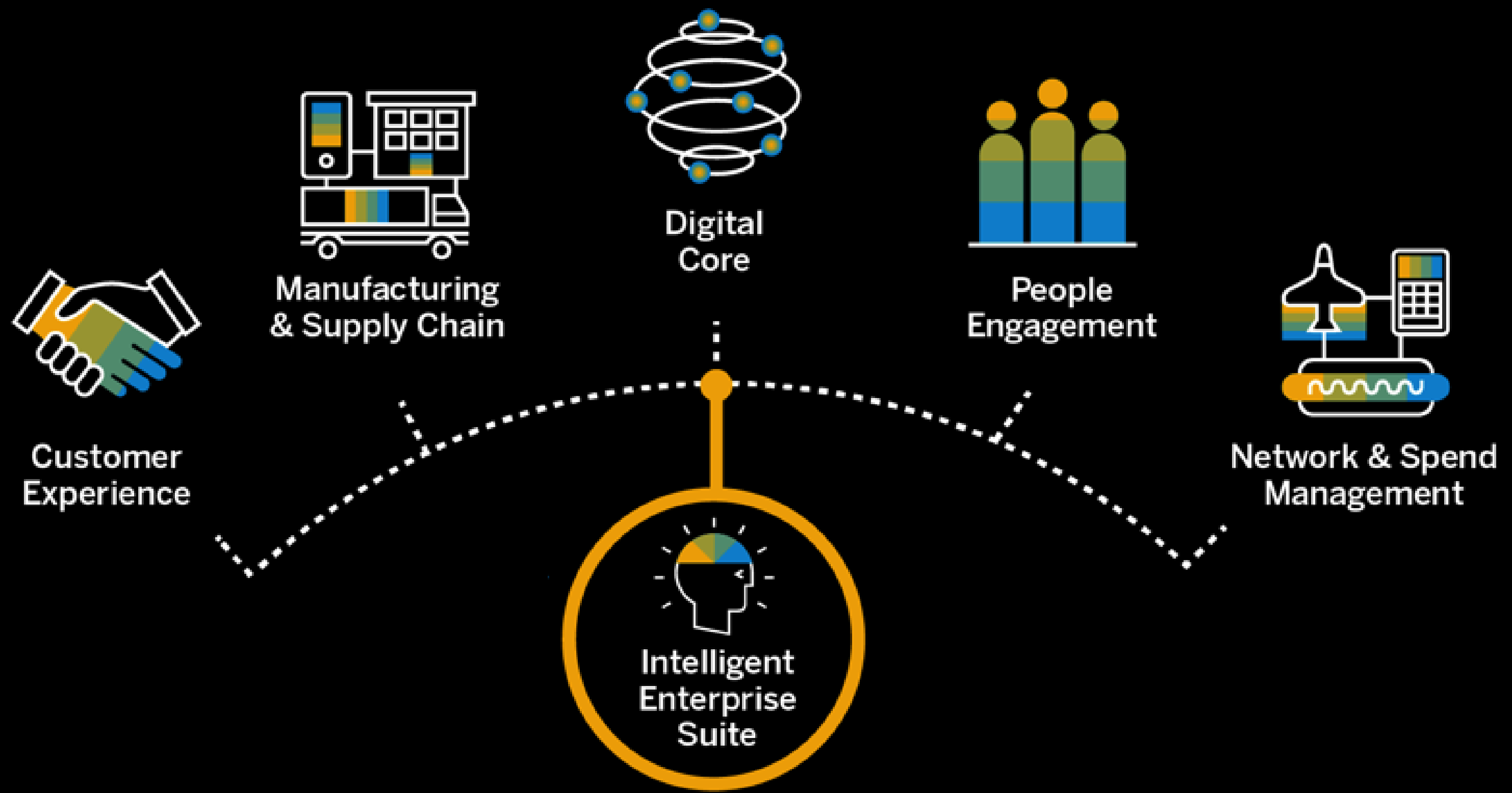


AUGMENT USER  
EXPERIENCE

AUTOMATE  
REPETITIVE  
WORK

ENABLE NEW  
BUSINESS  
MODELS





AUGMENT USER EXPERIENCE

AUTOMATE REPETITIVE WORK

ENABLE NEW BUSINESS MODELS



# Messaging apps are your solution



Hey, how are you?

Hiii, good and you? Are you up for a drink tonight? :)

Sure, 7pm?

Deal, see you then



MAKE AN INSURANCE CLAIM





Swisscom 21:27 39%

Startseite InnoJam2018 > Antwortet i.d.R. sofort

angenommen: PERIOR

In Zürich bei mir zu Hause

Wann ist der Schaden entstanden?

Gestern Abend



Neue Meldung: Hagelschaden  
Schadensmeldung:  
claimId-58f9264d-0591-4e40-8d89-  
b573173cd7f8

Meldung bestätigen  
Abbrechen

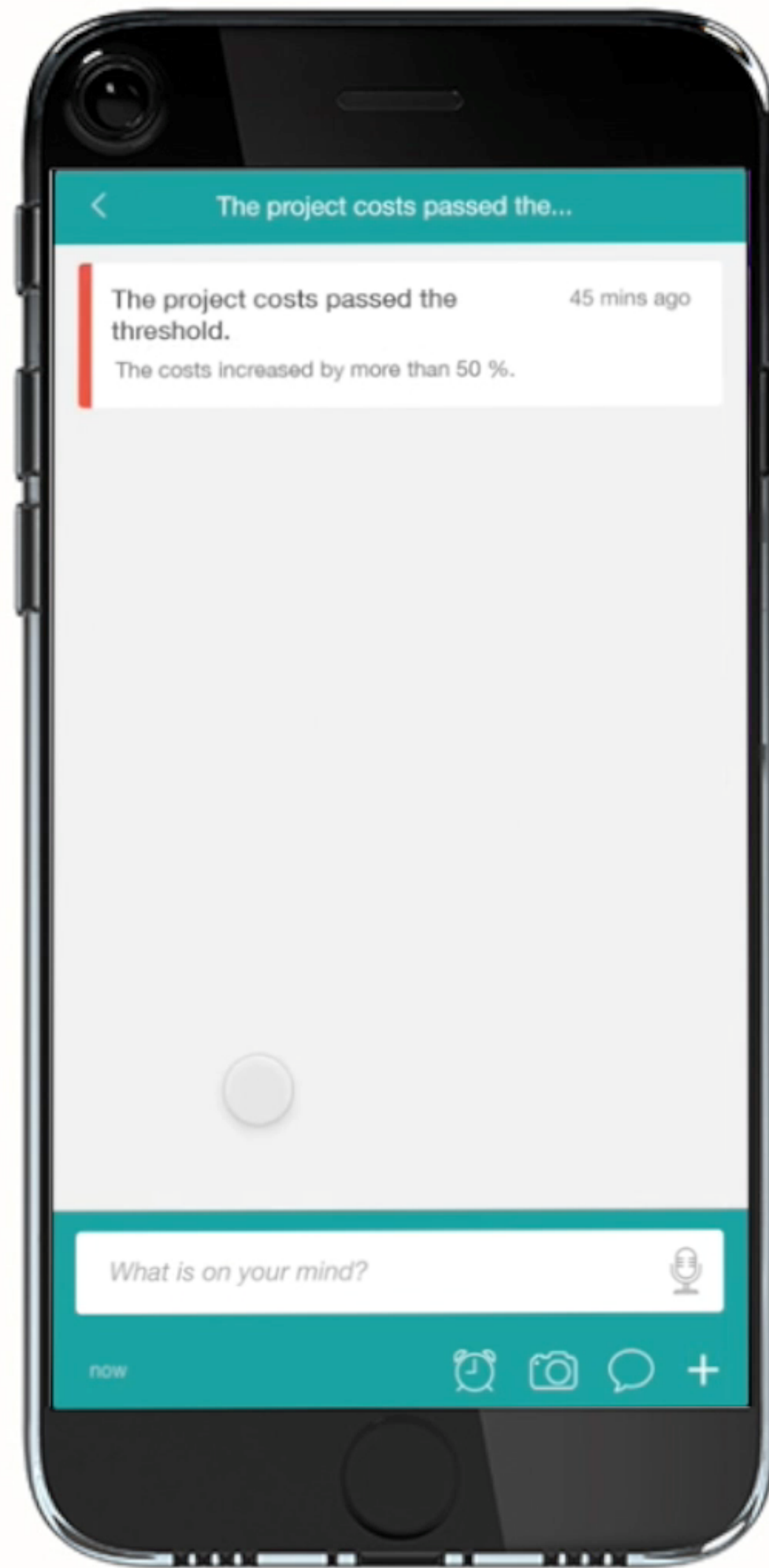
Meldung bestätigen

+ camera gallery microphone PERIOR smiley thumbs up



HELP PROJECT MANAGER WITH PROJECT ANALYSIS





The project costs passed the...

The project costs passed the threshold.

45 mins ago

The costs increased by more than 50 %.

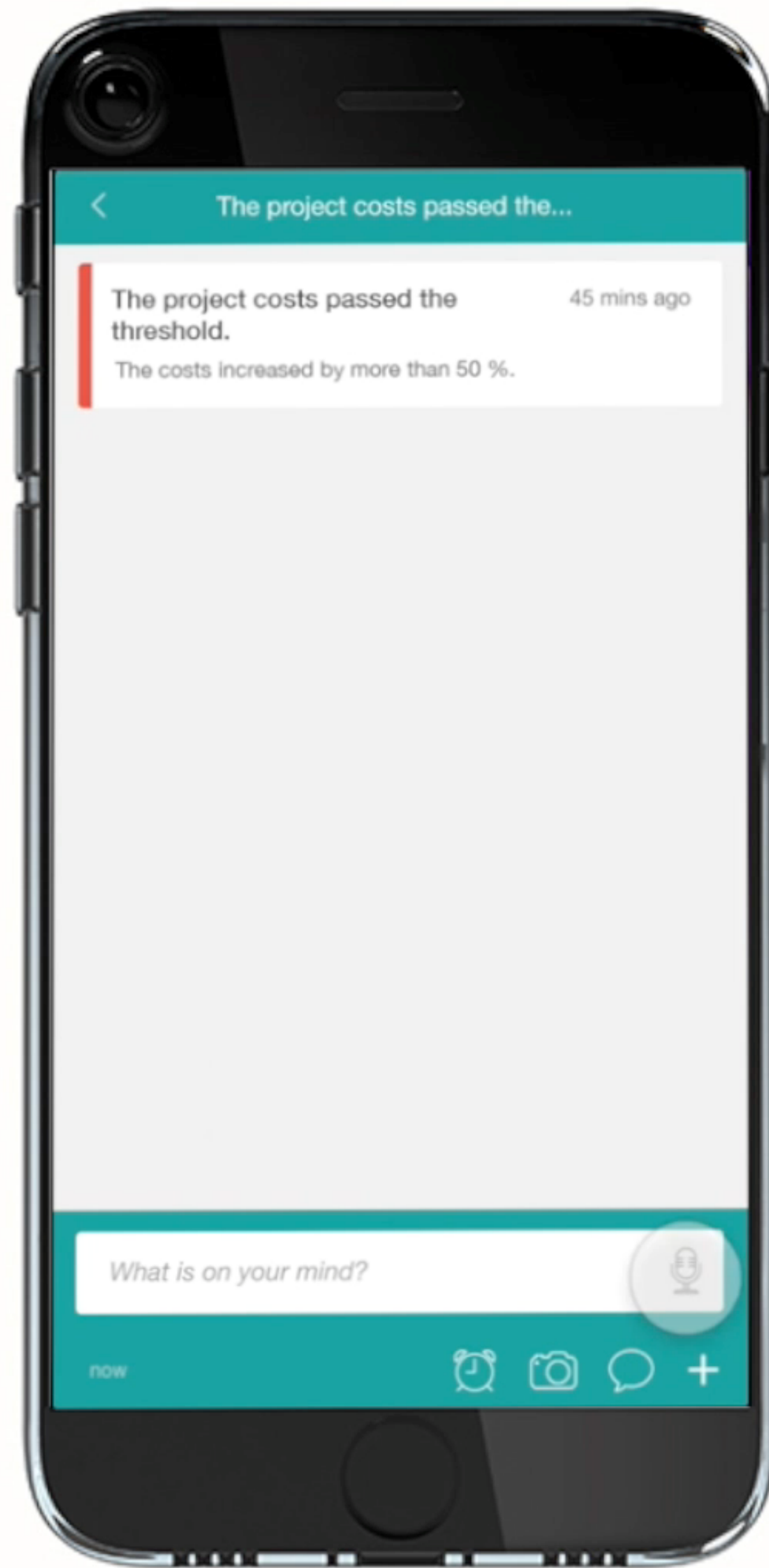
What is on your mind?



now







The project costs passed the...

The project costs passed the threshold.  
The costs increased by more than 50 %.

45 mins ago

What is on your mind?



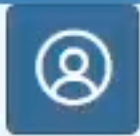
now





SUPPORT A CUSTOMER WITH A QUESTION

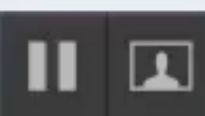




# Digital Assistant




Enter Text ... I






hello  
@12:46:09 μ.μ.

 Hello Mrs. Bell. How can we help you ?  
@12:46:09 μ.μ.


Enter Text ... 



hello  
@12:46:09 μ.μ.

 Hello Mrs. Bell. How can we help you ?  
@12:46:09 μ.μ.

the power is out  
@12:46:18 μ.μ.


 I understand that you are experiencing an electricity outage. Is that correct ?  
@12:46:18 μ.μ.

Enter Text ... 




hello  
@12:46:09 μ.μ.



 Hello Mrs. Bell. How can we help you ?  
@12:46:09 μ.μ.


the power is out  
@12:46:18 μ.μ.



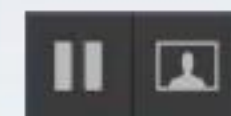
 I understand that you are experiencing an electricity outage. Is that correct ?  
@12:46:18 μ.μ.

yes  
@12:46:23 μ.μ.



 Thank you for verifying. I recognize that the problem is at Buchanan st in London. Is that correct ?  
@12:46:23 μ.μ.

Enter Text ...





Digital Assistant

Thank you for verifying. I recognize that the problem is at Buchanan st in London. Is that correct ?  
@12:46:23 μ.μ.

yes  
@12:46:32 μ.μ.

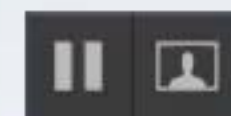
All right, we are running diagnostics at Buchanan st in London.



@12:46:32 μ.μ.

It seems that this is a local issue that affect you .Would you like to request a visit now ?  
@12:46:37 μ.μ.

Enter Text ... I





All right, we are running diagnostics at Buchanan st in London.



@12:46:32 μ.μ.

It seems that this is a local issue that affect you .Would you like to request a visit now ?

@12:46:37 μ.μ.

yes

@12:47:01 μ.μ.

Senior Technician Mike Mayers will be at your location in 30 minutes. Would you like to accept this appointment ?

@12:47:01 μ.μ.



Digital Assistant



@12:46:32 μ.μ.

It seems that this is a local issue that affect you .Would you like to request a visit now ?  
@12:46:37 μ.μ.

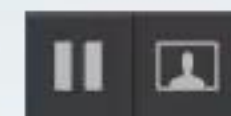
yes  
@12:47:01 μ.μ.

Senior Technician Mike Mayers will be at your location in 30 minutes. Would you like to accept this apppointment ?  
@12:47:01 μ.μ.

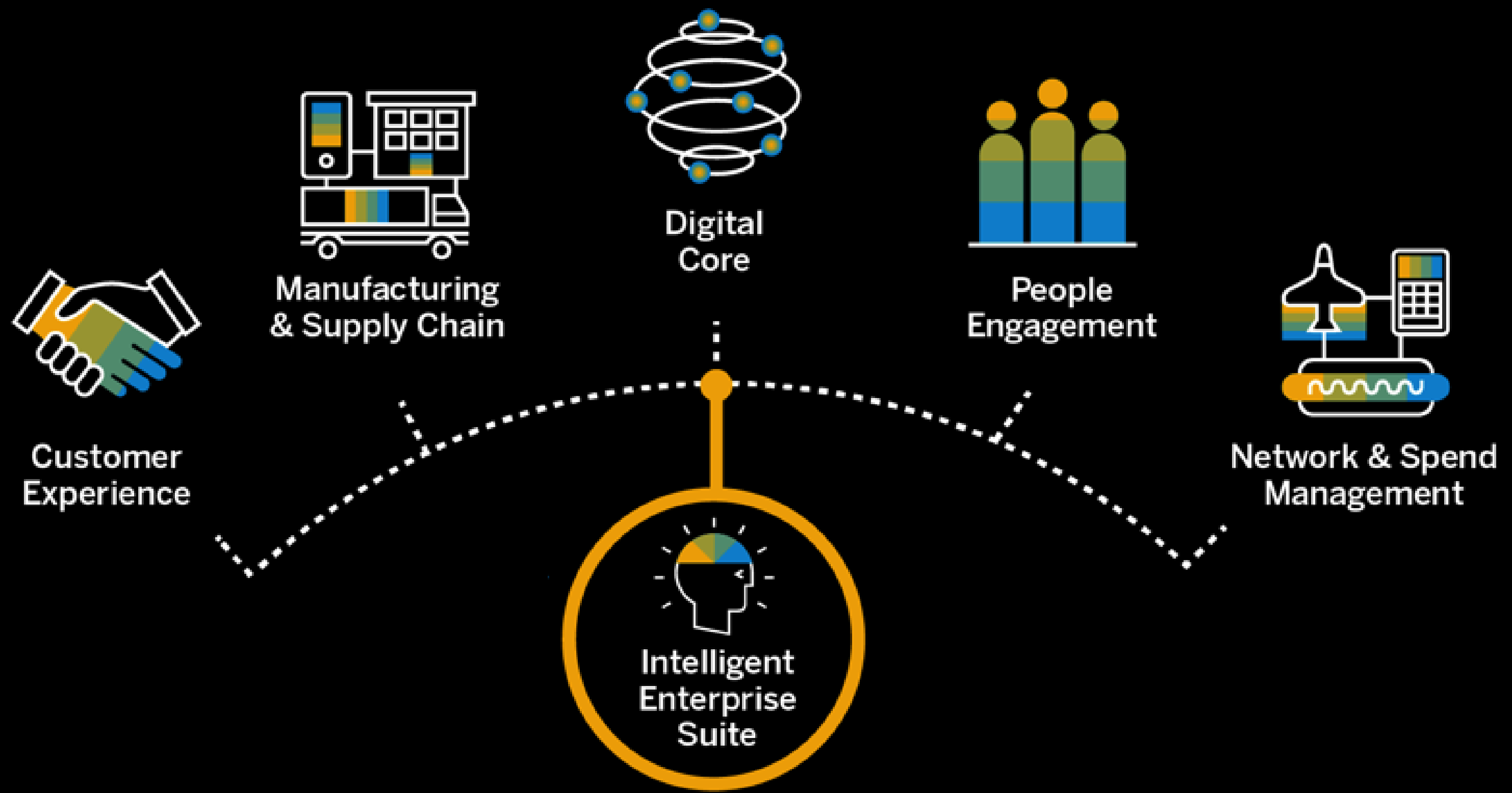
yes  
@12:47:26 μ.μ.

Your appointment number is 100064563. Thank you for your patience.  
@12:47:26 μ.μ.

Enter Text ...







AUGMENT USER  
EXPERIENCE

AUTOMATE  
REPETITIVE  
WORK

ENABLE NEW  
BUSINESS  
MODELS



MATCH INVOICES AND PAYMENTS





Invoice Matching



Mail



Calendar



Safari



FILMIC Pro



Keynote



MetaRecorder



Payments (8)

Filter By: All [Dropdown] Search [Input] [Search Icon]

Bank Reference	Posting Date	Amount	Payment Note
<input type="radio"/> 10901	20110709	193.35 EUR	UT Hypermart00001200010 276
<input type="radio"/> 13955	20110721	240.54 EUR	Global Foodie Intl
<input type="radio"/> 16030	20110803	948.28 EUR	UT Hypermart 0001200006869
<input type="radio"/> 16934	20110919	493.88 EUR	
<input type="radio"/> 17101	20110922	697.37 EUR	Global Foodie Intl 05044704840
<input type="radio"/> 17811	20110930	935.00 EUR	GENERIC PHARMA FINLAND OYLONNROTINKU HELSINKI 0076300940029
<input type="radio"/> 18556	20111005	1,166.50 EUR	GENERIC PHARMA FINLAND OYLONNROTINKU HELSINKI

Invoices (22)

Filter By: All [Dropdown] Search [Input] [Search Icon]

Invoice Number	Customer Name	Amount	Due Date
<input type="checkbox"/> 7630095191	GENERIC PH...	819.65 EUR	20120104
<input type="checkbox"/> 7630094029	GENERIC PH...	934.69 EUR	20111228
<input type="checkbox"/> 7630093435	GENERIC PH...	1,098.11 EUR	20111225
<input type="checkbox"/> 7610681322	GENERIC PH...	839.16 EUR	20111227
<input type="checkbox"/> 7630094733	GENERIC PH...	1,163.43 EUR	20120101
<input type="checkbox"/> 7610691768	GENERIC PH...	860.21 EUR	20120103
<input type="checkbox"/> 7630095182	GENERIC PH...	1,165.47 EUR	20120104

Surplus / Deficit Amount:  EUR

Comment:

Balance: 0.00 EUR Post



PREVENTION OF HEALTH AND SAFETY INCIDENTS



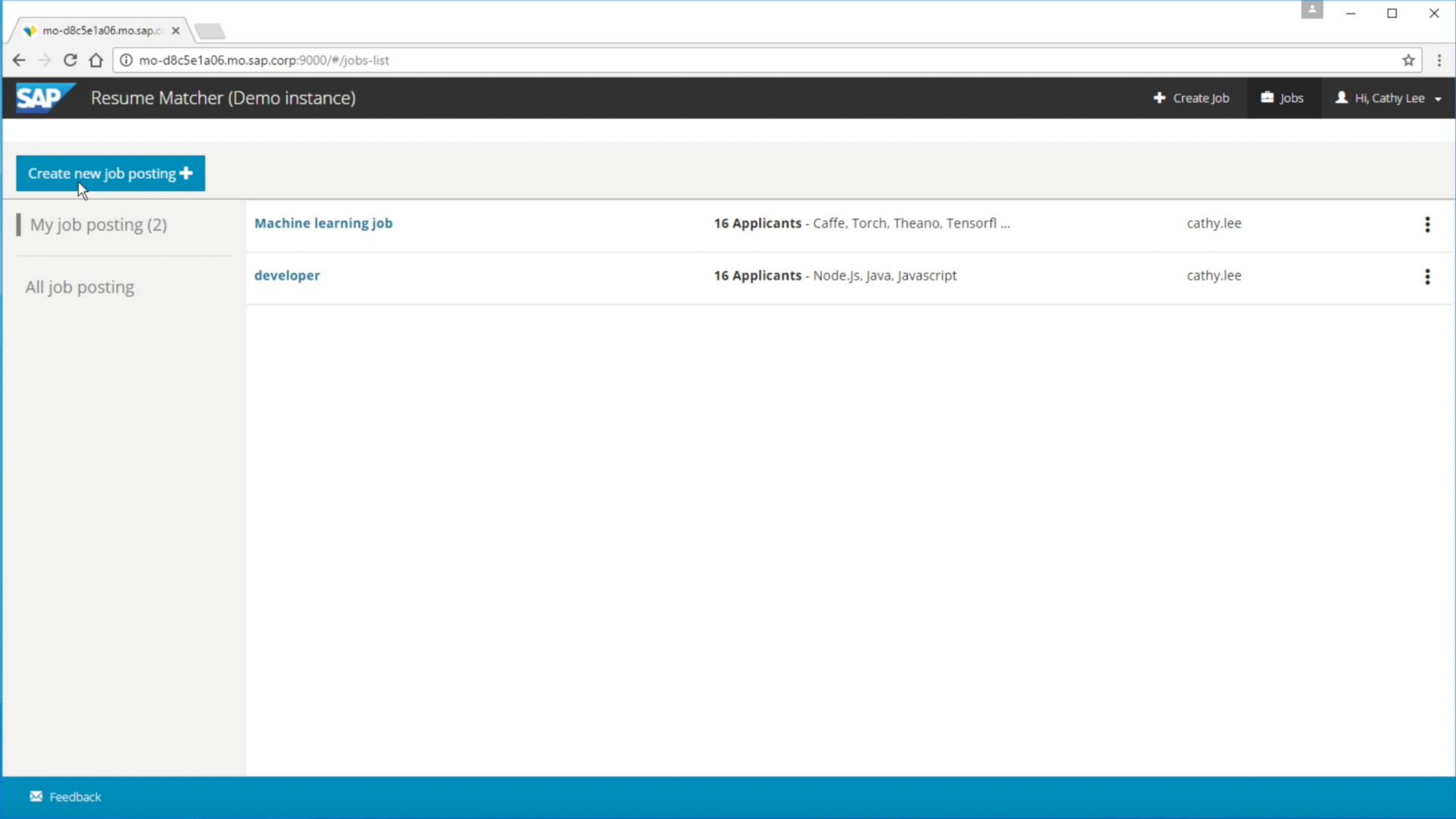


НЛМК



MATCH JOB POSTING WITH CANDIDATES





Create new job posting +

My job posting (2)

All job posting

Machine learning job	16 Applicants - Caffe, Torch, Theano, Tensorfl ...	cathy.lee	⋮
developer	16 Applicants - Node.js, Java, Javascript	cathy.lee	⋮

[Account Executive - Business, Account, Consulting](#) ✕



Candidates Shortlists (0)

+ Add

Filter the results

Filter by keywords, skill etc

Add a tag

Filter by job industry and category

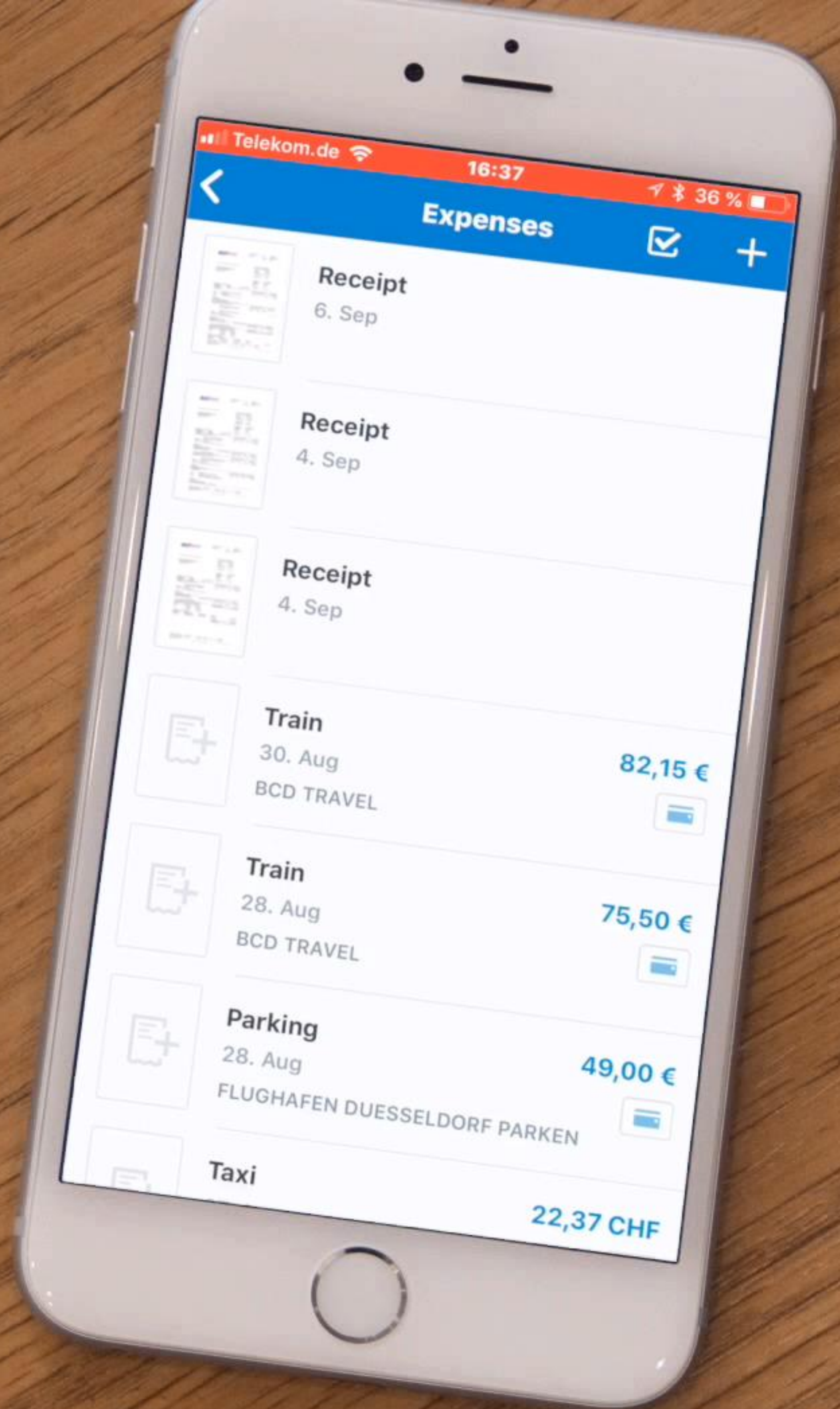
Select

Rank	Candidate	Source	Overall	Education	Skill
1	<b>Sales Candidate 3</b> <i>Matching Keywords:</i> Sales, Business, Partner, Data, Marketing, <i>Industries:</i> Manufacturing, It, Healthcare,	Applicants	10.0	10.0	8.8
1	<b>Sales Candidate 9</b> <i>Matching Keywords:</i> Sales, New, Leadership, Solutions, Accounts, <i>Industries:</i> It, Media, Logistics,	Applicants	10.0	8.0	10.0
2	<b>Sales Candidate 8</b> <i>Matching Keywords:</i> Sales, Software, New, Clientele, Marketing, <i>Industries:</i> It, Media, Telecom,	Applicants	9.0	7.6	8.8
3	<b>Sales Candidate 4</b> <i>Matching Keywords:</i> Sales, Consultant, Business, Pricing, Management, <i>Industries:</i> Manufacturing, It, Logistics,	Applicants	8.6	9.6	7.0
4	<b>Sales Candidate 2</b> <i>Matching Keywords:</i> Sales, Business, Consultant, Pricing, Global, <i>Industries:</i> Manufacturing, It, Logistics,	Applicants	8.4	8.8	7.2
5	<b>Sales Candidate 6</b> <i>Matching Keywords:</i> Sales, Senior, Enterprise, Product, Businesses, <i>Industries:</i> Manufacturing, Banking, Logistics,	Applicants	8.2	8.2	7.2



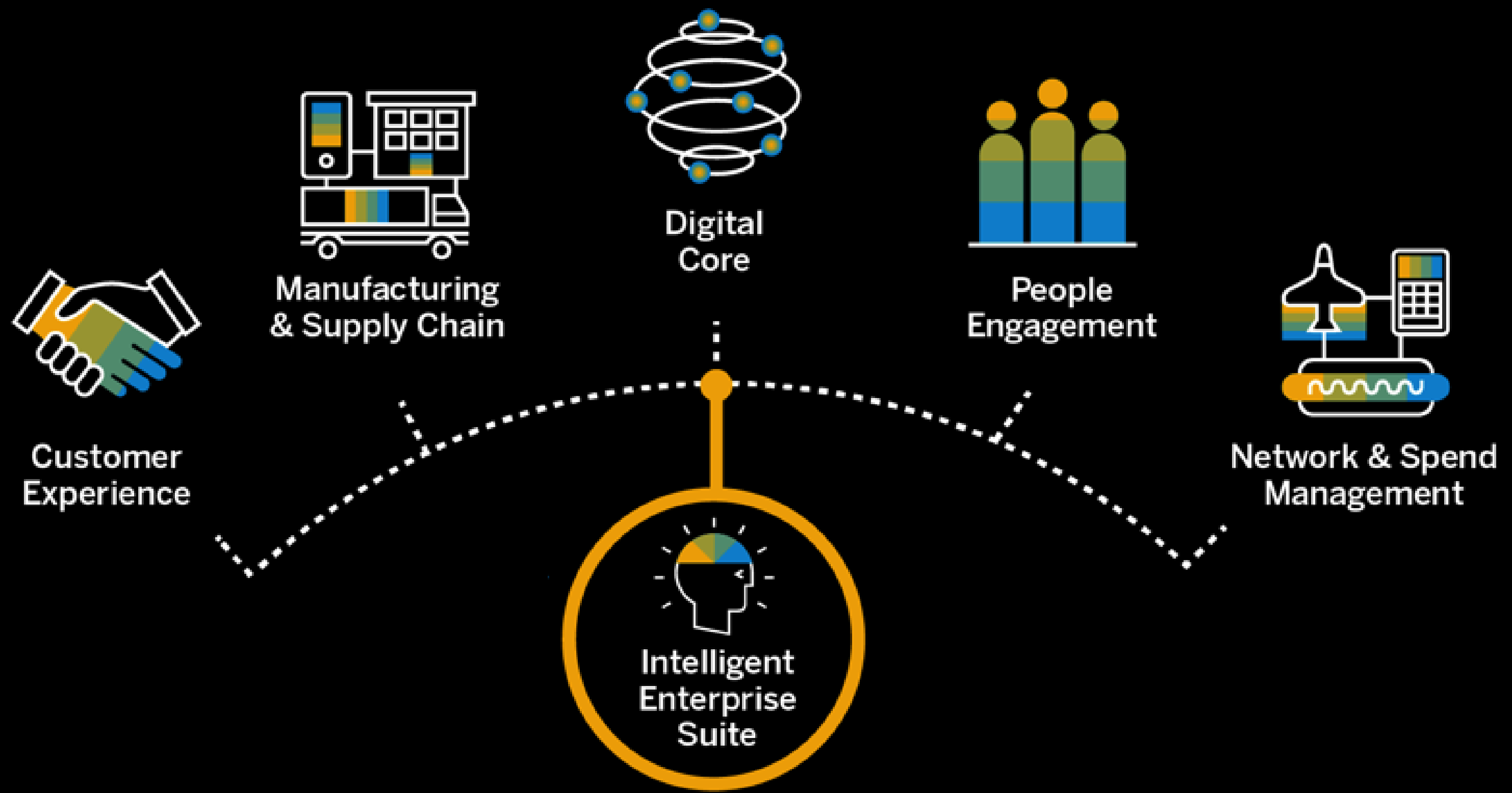
EASY TRAVEL EXPENSE





Expenses		
Receipt	6. Sep	
Receipt	4. Sep	
Receipt	4. Sep	
Train	30. Aug BCD TRAVEL	82,15 €
Train	28. Aug BCD TRAVEL	75,50 €
Parking	28. Aug FLUGHAFEN DUESSELDORF PARKEN	49,00 €
Taxi		22,37 CHF





AUGMENT USER EXPERIENCE

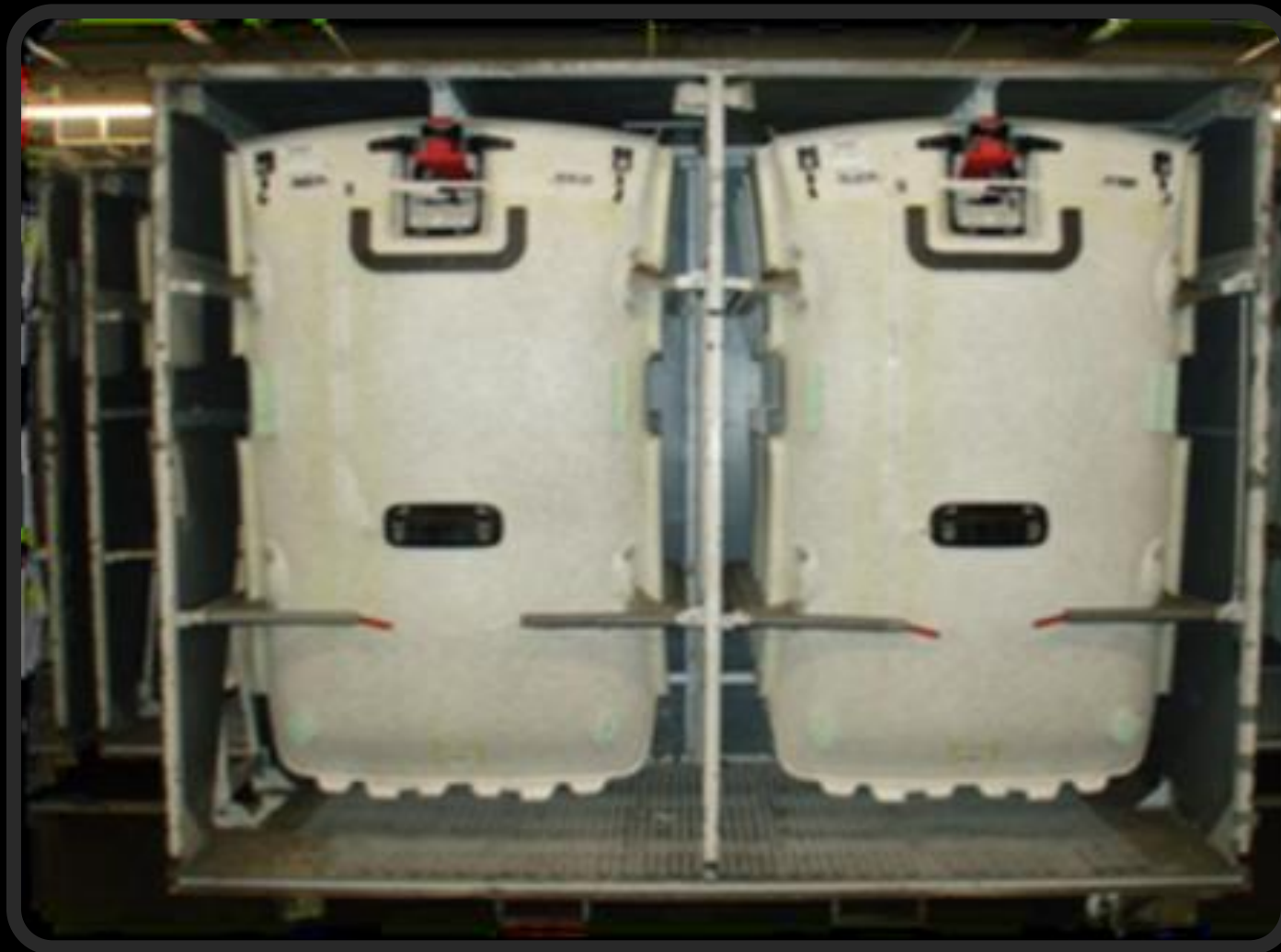
AUTOMATE REPETITIVE WORK

ENABLE NEW BUSINESS MODELS

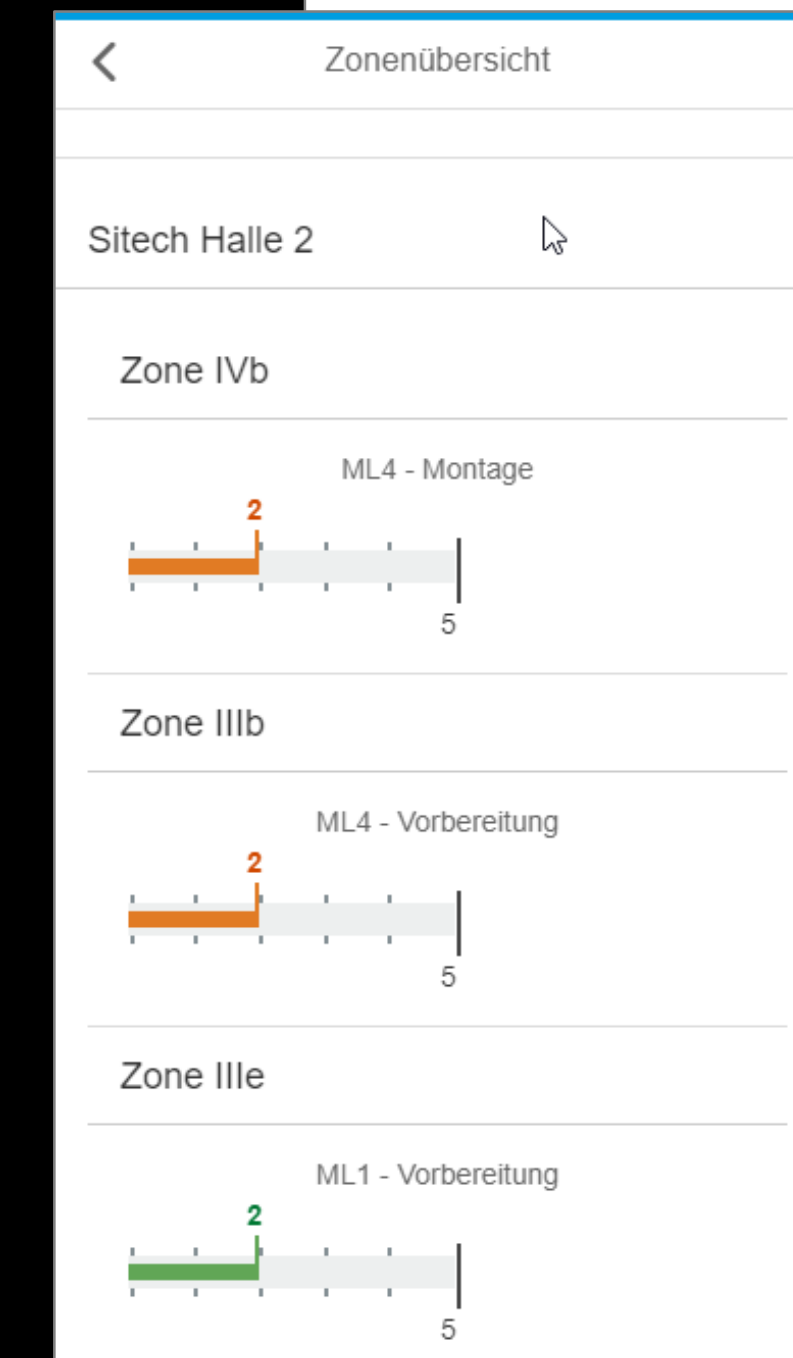
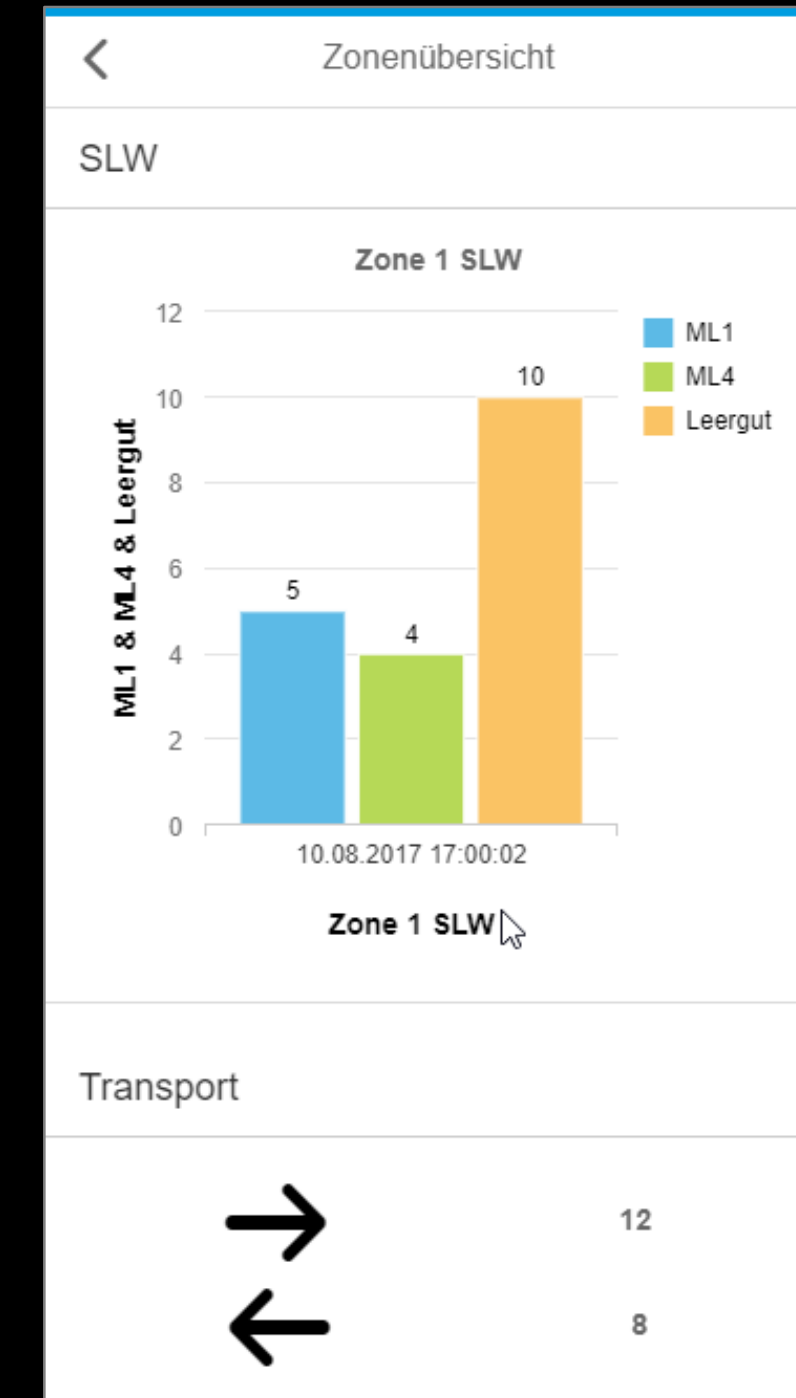
IMPROVE AND ENABLE NEW JIS SERVICES



# Monitoring containers

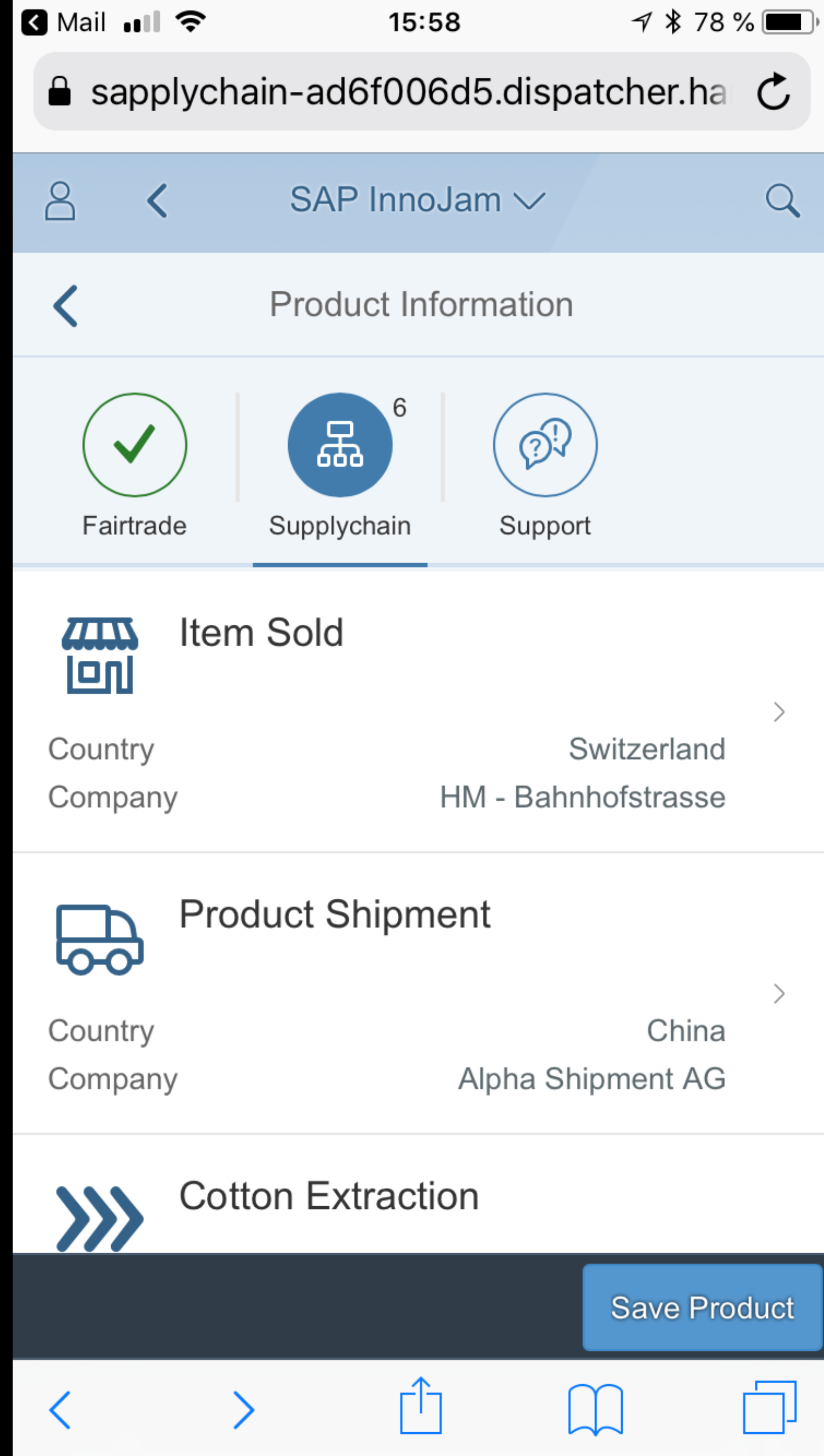


## Mobile View

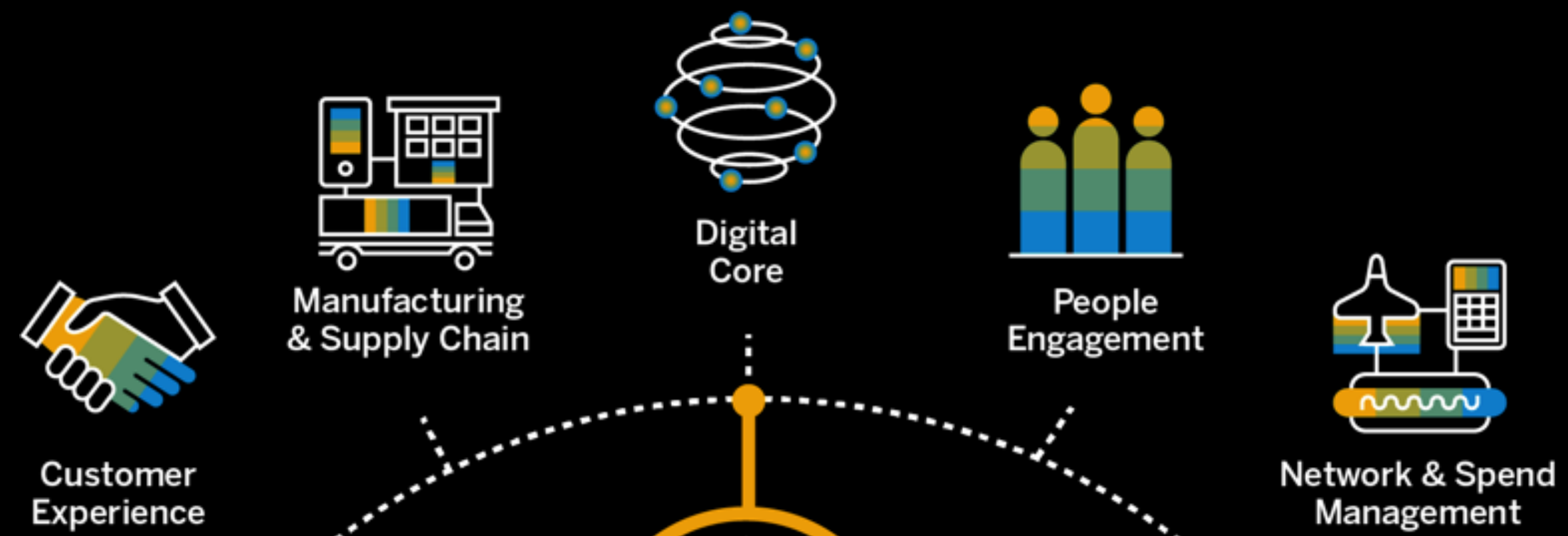


# SUPPLY CHAIN TRACEABILITY FOR CLOTHES



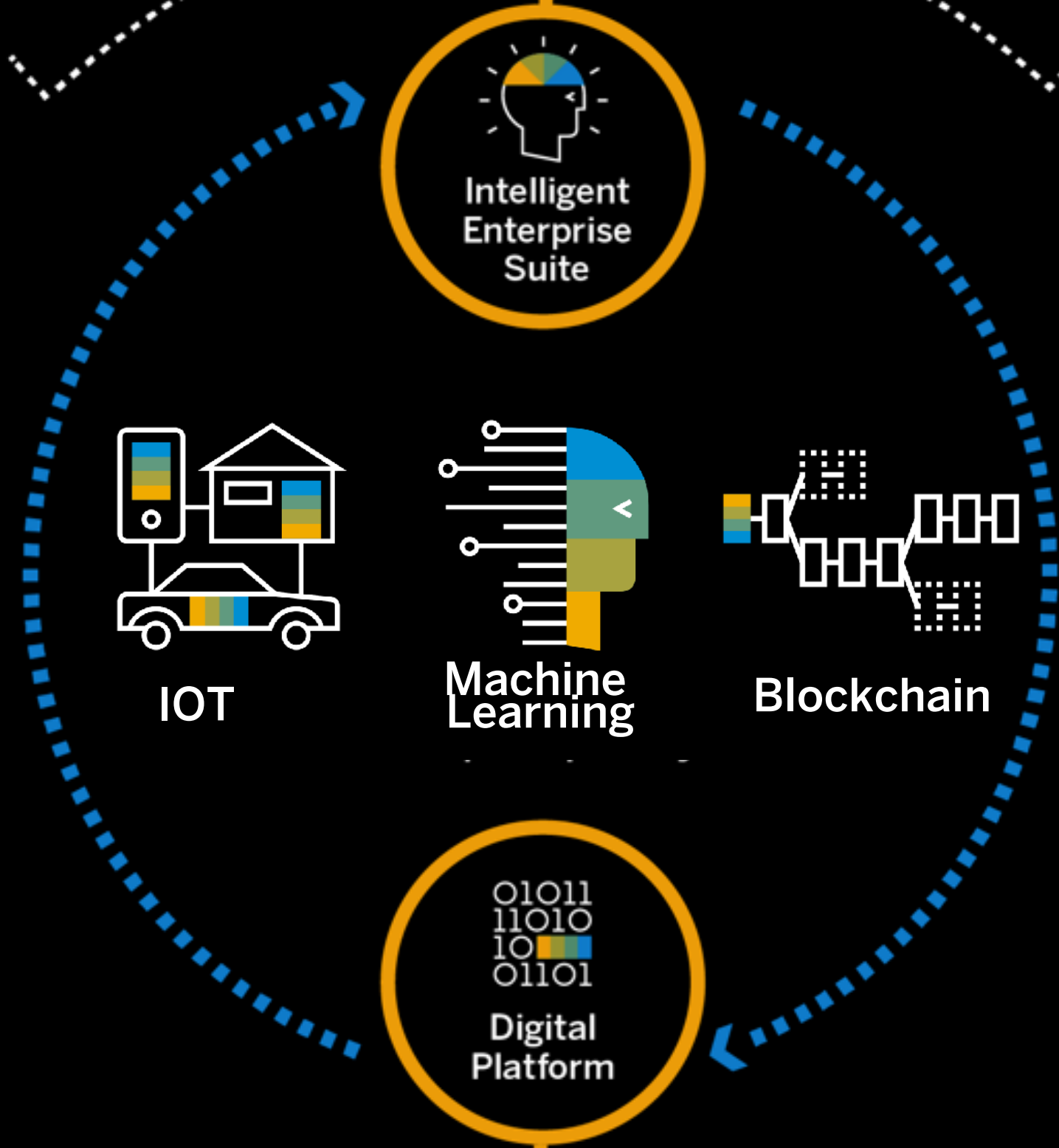


APPLICATIONS



AUGMENT USER EXPERIENCE

INTELLIGENT TECHNOLOGIES



AUTOMATE REPETITIVE WORK

FUNDAMENT



ENABLE NEW BUSINESS MODELS













[marcus.raben@sap.com](mailto:marcus.raben@sap.com)  
[@markraben](#)