

Accion
INNOVATION
SUMMIT 2023

02-05 March 2023,
Sofitel Dubai
The Palm Jumeirah
Dubai

INNOVATION SUMMIT 2023



Accion

INNOVATION SUMMIT 2023

Accionlabs

Accountability of your Digital Transformation Investments A Healthcare Industry Perspective



Mikunj Joshi

Healthcare Practice

Healthcare Technology enthusiast helping Healthcare businesses maximize returns on Technology and Innovation Engineering Investments

Built early versions of PHRs, HIEs and Value Based Care
Love reading, travel, cricket and Bollywood music!



Sunil Das G

Sr. Delivery Director

Engineering Leader with experience leading large-scale Digital Transformation Programs and global teams delivering high impact projects

Expertise in managing Product Development for EDCs and Start-ups to drive Product Strategy & New Product Development with Engineering excellence and Efficiency

Questions

How can we improve confidence in ROI of Digital Transformation (DTx) programs?
How can we ensure the program will meet the intended business goals?
What KPIs should we monitor & how do we map them to business goals?
How do we monitor it and course correct in a timely manner?
What changes are needed to our Program Governance framework?
A Case Study - building a Value based Healthcare DTx Platform

DTx is all good, but show me the money

Measuring Return on Investment (ROI) can be challenging:



Difficulty in defining and measuring success



Lack of data



Time and resource constraints



Difficulty in attributing impact to specific initiatives

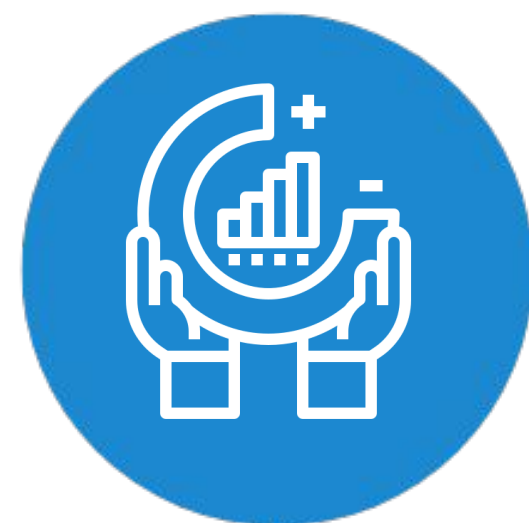


Changing business environment

But you must do it, in order to:



Justify the investment in digital initiatives



Evaluate the success of your initiatives



Make data-driven decisions about future investments



Accountability Framework



Ensure business goals are clearly defined and understood



Define SMART* KPIs for each goal



Incorporate KPIs into your Measurement Plan



Monitor and Analyze the data regularly



Communicate the results

* SMART - Specific, Measurable, Attainable, Relevant, and Time-Bound

Ok, but how do I align every hour of every team member to my goals?



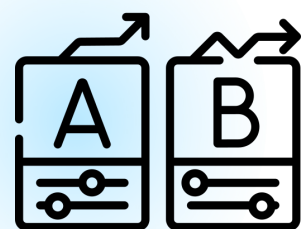
Determine Data Sources for each KPI



Set Baseline Metrics



Set Targets



Establish Metrics for Each Sprint



Review and Analyze Metrics



Use Insights to Drive Improvements



Value Based Healthcare (aka ObamaCare)

Key objectives of a Value-based care system:



Improve health outcomes



Increase patient engagement



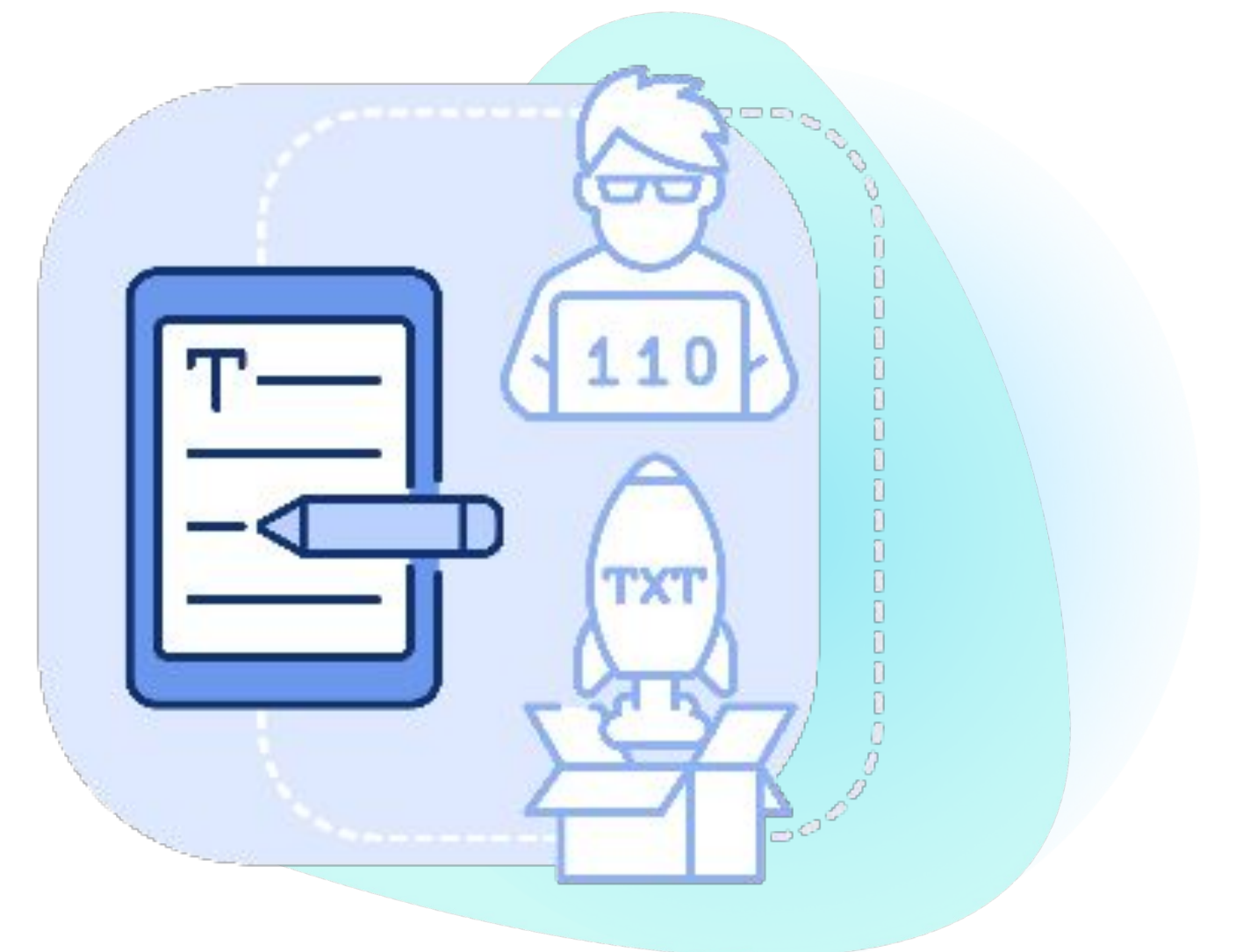
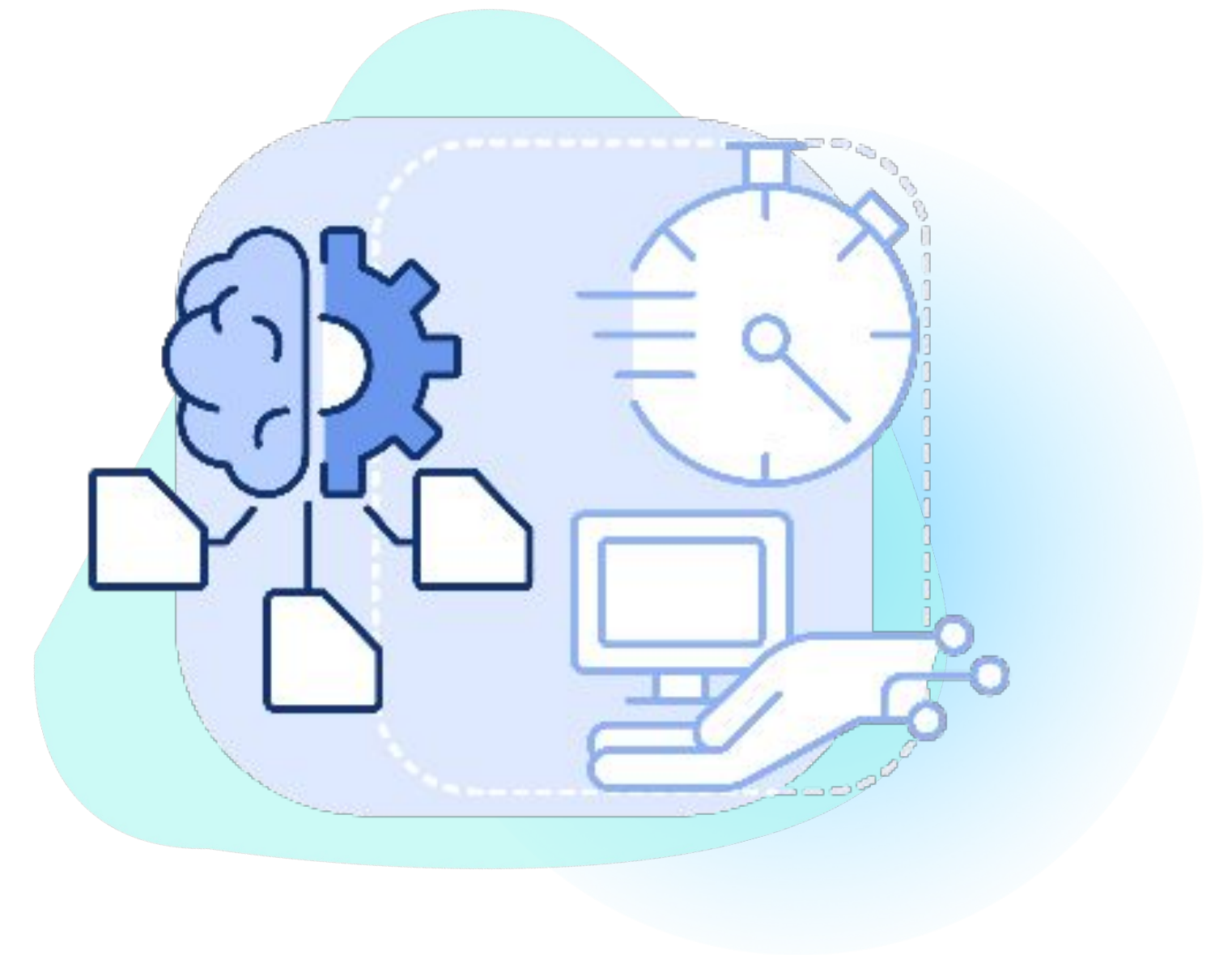
Lower healthcare costs



Enhance care coordination



Promote data-driven decision making



An Interconnected Value system

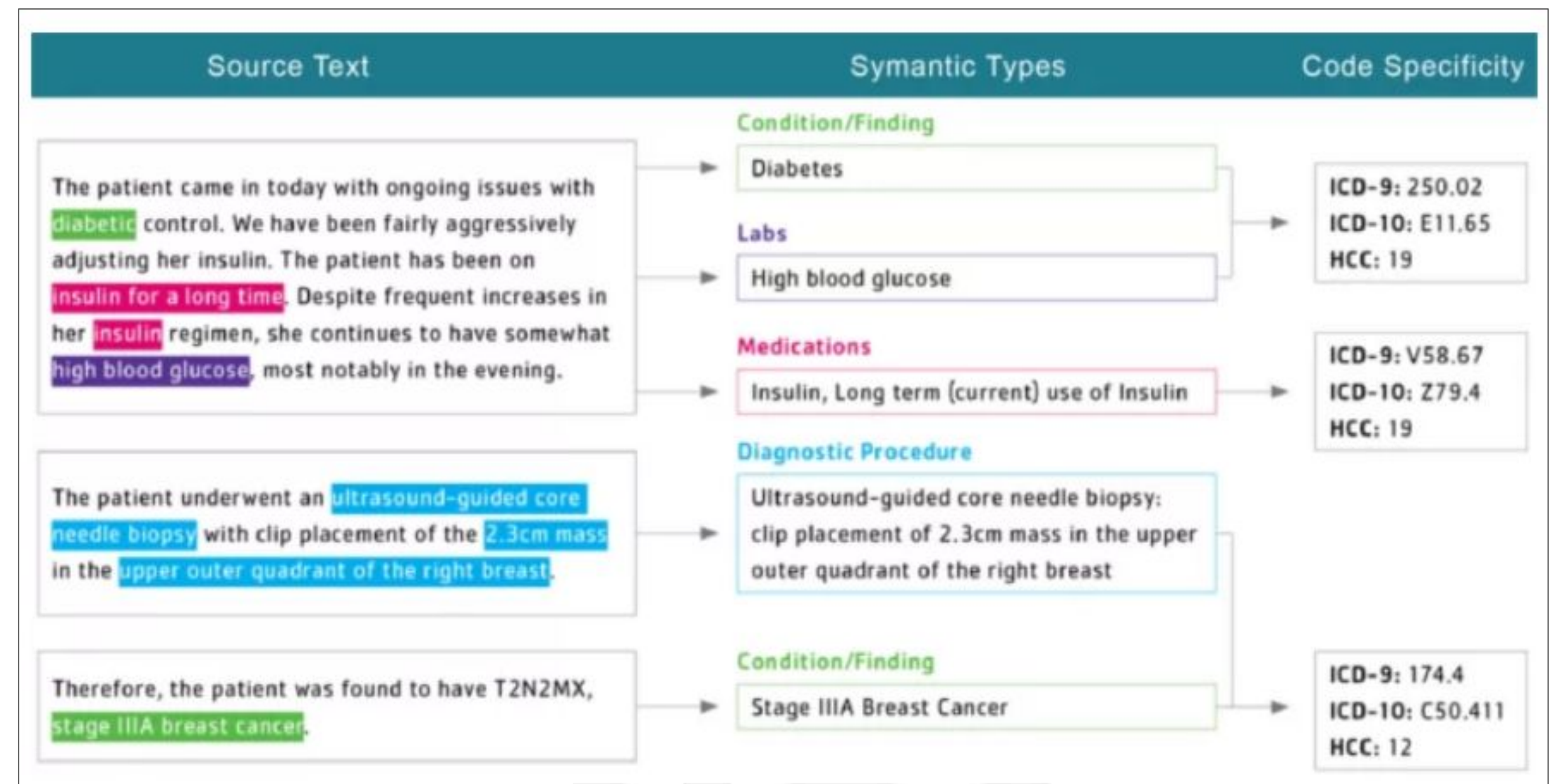
Goals	Patient	Provider	Community
Health Outcomes	Patient-reported outcomes Functional status Mortality rate	Quality Ratings ACA Compliance	Life expectancy Infant mortality rate
Patient Engagement	Pre-admission readiness Patient satisfaction	Operational Efficiencies Recurring Revenue	Mental health status Behavioral risk factors
Lower Cost	Responsible Choices Out of Pocket Cost Pass through savings	Operational Margins Resource Utilization	Chronic diseases mgmt Preventive services
Better Care Coordination	Patient safety Readmission rate	Hospital-acquired infection Malpractice Claims	Vaccination rates Medication adherence Worker Productivity
Data Driven Decisions	Length of stay ED wait times	Clinical Decision Support Patient 360 Records	Interoperability - HIEs Access to healthcare

Personalization of benefit plans needs deep insights into patient's clinical data

- Data resident across different System of Records (SORs)
- High volume of unstructured clinical data
- Multiple documents types including clinical progress notes, eRx, Orders, handwritten notes etc

Technologies and Frameworks

- OCR and NLP to extract contextual content and terms
- ML pipelines to process large blobs of text and map them to clinical codes
- Create patient risk profiles by combining related clinical codes (concepts)
- ML Algorithms that identify personalized benefit plans based on patient risk markers



Keys to building a Governance Framework



Governance Team

Agile Governance team to oversee the compliances in Business Programs



Business Alignment

Framework ensuring Program's objectives are aligned with the Organization's Business Strategy & Vision



Continuous Feedback

Mechanism for collecting various stakeholders feedback and incorporating them into the Business Program



Risk Management

Mechanism for continuous identification of risks and have appropriate mitigation & contingency plan



Continuous Improvement

Regular retrospective for identifying the areas of improvement & implementing them to the Program

Case Study: ICD Codes Prediction Model

REQUIREMENT

Build a model to predict the billable ICD codes from Patient chart documents (say heart patient)

Model Type: Classification model

Following are the possible ICD code predictions by the model, against the Patient chart (data):

- **True Positive (TP)**
Right code predicted correctly (eg. Patient **WITH Heart disease** identified as **Heart patient**)
- **True Negative (TN)**
Incorrect code predicted correctly (Patient **WITHOUT Heart disease** identified as **No Heart patient**)
- **False Positive (FP)**
Incorrect code wrongly predicted (Patient **WITHOUT Heart disease** identified as **Heart patient**)
- **False Negative (FN)**
Right code wrongly predicted (Patient **WITH Heart disease** identified as **No Heart patient**)



Case Study: ICD Codes Prediction Model (contd..)

KPIs to monitor how good is the model

PRECISION

Measures the accuracy of positive predictions

$$\text{Precision} = \frac{TP}{TP + FP}$$

ACCURACY

Its is the fraction of predictions the model got right/correct

$$\text{Accuracy} = \frac{\text{Number of correct predictions}}{\text{Total number of predictions}}$$

$$\text{Accuracy} = \frac{TP + TN}{TP + TN + FP + FN}$$

ROC-AUC

Receiver Operating Characteristic is a graph showing the performance of a classification at all the classification thresholds. This curve plots two parameters:

- True Positive Rate (TPR) $TPR = \frac{TP}{TP + FN}$
- False Positive Rate (FPR) $FPR = \frac{FP}{FP + TN}$

AUC (Area Under ROC Curve) measures the entire 2-D area underneath the entire ROC curve from (0,0) to (1,1)

AUC provides an aggregate measure of performance across all possible classification thresholds. It is a probability that the model ranks a random positive example more highly than a random negative example

Models with a high AUC are called models with good skills.

RECALL

Measures the completeness of positive predictions

$$\text{Recall} = \frac{TP}{TP + FN}$$

F1-SCORE

It is the Harmonic mean of the Precision & Recall

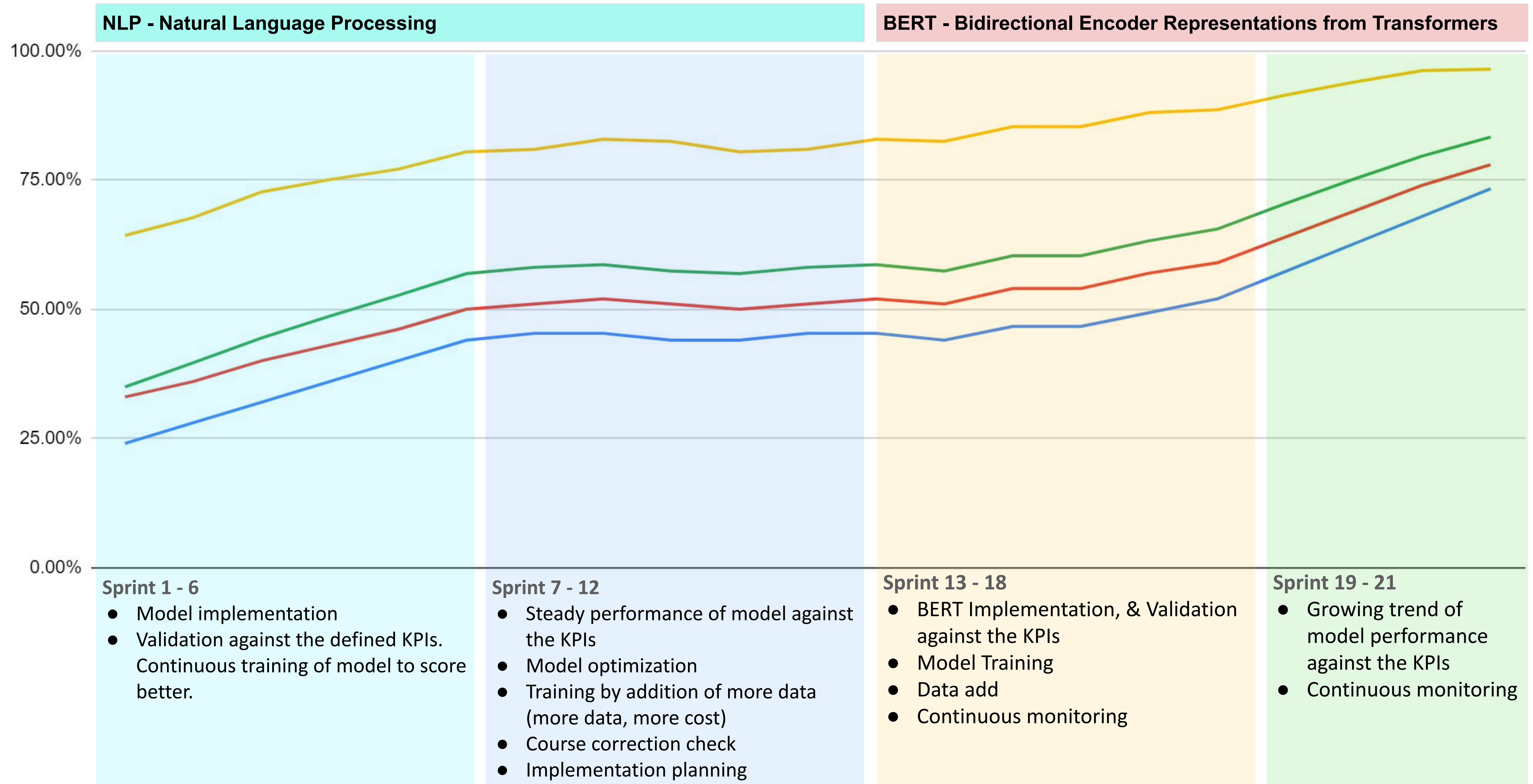
$$F1 \text{ Score} = 2 * \frac{\text{Precision} * \text{Recall}}{\text{Precision} + \text{Recall}}$$

These KPIs are regularly monitored to ensure the developed/incorporated model is running as expected, or it needs some more training, or there is a need to bring in some other model to support the Business need by replacing the existing model

Sprint-on-Sprint monitoring of defined KPIs

Precision, Accuracy, Recall and F1-Score

Precision Accuracy Recall F1-Score



Accion
INNOVATION
SUMMIT 2023

Thank You!

Mikunj Joshi
mikunj.joshi@accionlabs.com

Sunil Das
sunil.das@accionlabs.com

INNOVATION SUMMIT 2023

