Improving health care outcomes using the power of AI and Open Standard

Sunil Mishra
Senior Software Engineer,
Member – IBM Academy of Technology,
IBM Watson Health,

HIMSS NORTH CAROLINA Chapter

Agenda

- Problem statement
- What end users need
- How to build an “Insight as Service” API
- What was developed: minimum viable product (MVP)
- Lessons learned
- Q &A

Problem statement

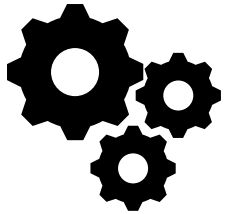
- Frequently, pre-surgery education is too generic, not personalized sufficiently for patients to understand-- and follow
- Information format is old fashioned
  - Brochure
  - Computer Disk
  - Video Tapes
- There is insufficient information to obtain predictive insight for risk and outcomes based on traditional data elements
  - Age
  - Weight
  - Height
  - Gender
  - Race
- Most health information systems are not capable of collecting real-time feedback from-and-to patients as they prepare for their scheduled surgery

What patients say they want- and need- *before* surgery

- Pre-surgery education personalized to their profile, such as
  - Age
  - Weight
  - Height
  - Gender
  - Race
- Risk and outcome predictions based upon their current health situation
  - Length of stay
  - Revision risk
  - Complication
  - Post operation recovery
- Personalized suggestions to improve their surgical outcomes
- The ability to stay in constant contact with their healthcare provider

Insight as Service API – Cognitive Model

- Built a 40,000 patients cohort with data from IBM Explorys
- Used cohort data for building the model
- Ultimately creating a new Risk Assessment
  - Length of stay
  - Revision within 18 months
  - Complications
  - Post operation recovery



Insight as Service API - Data Exchange and Delivery

- Selected Fast Healthcare Interoperability Resources (FHIR) for data exchange
- Primarily used FHIR resources

 Patient

 Questionnaire

 Observation

 Risk Assessment

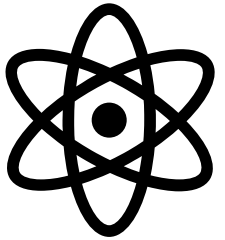
FHIR®

HIMSS NORTH CAROLINA Chapter

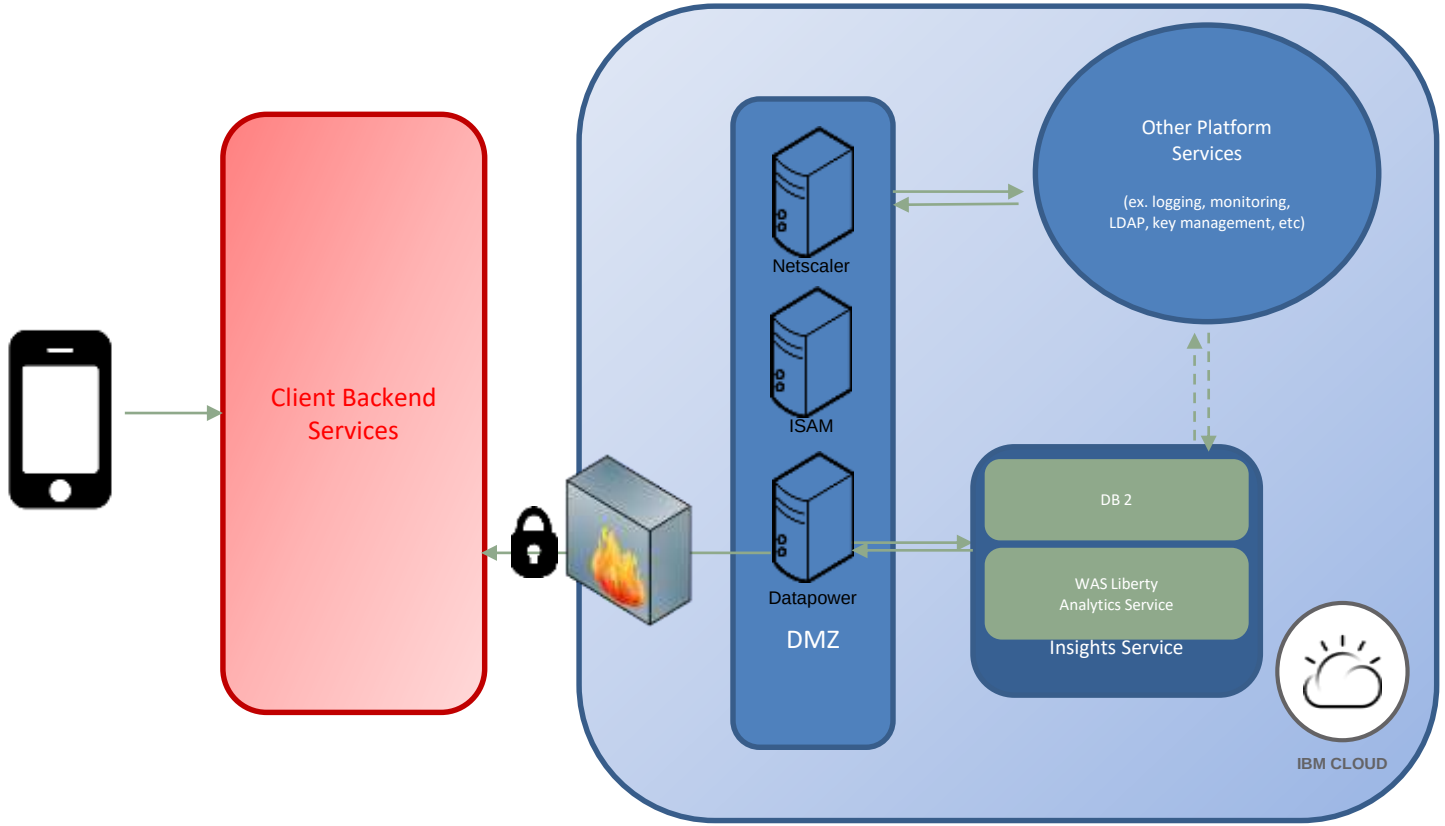
Watson Health

Insight as Service API -Connecting the dots

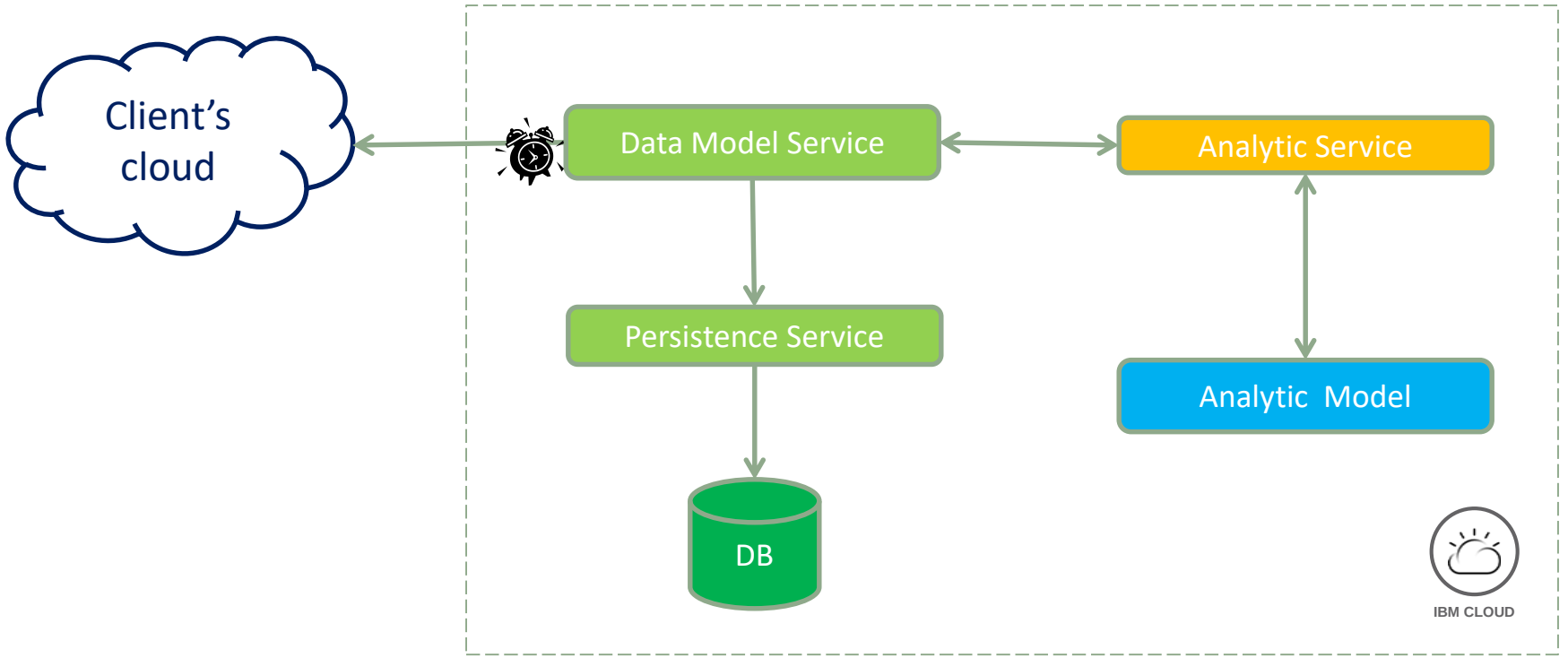
- Representational State Transfer (REST) based API
- Pull approach/ Timer Service for data collection
- Data transformation
- Data Persistence
- API to deliver the Risk Assessment back to the calling system.



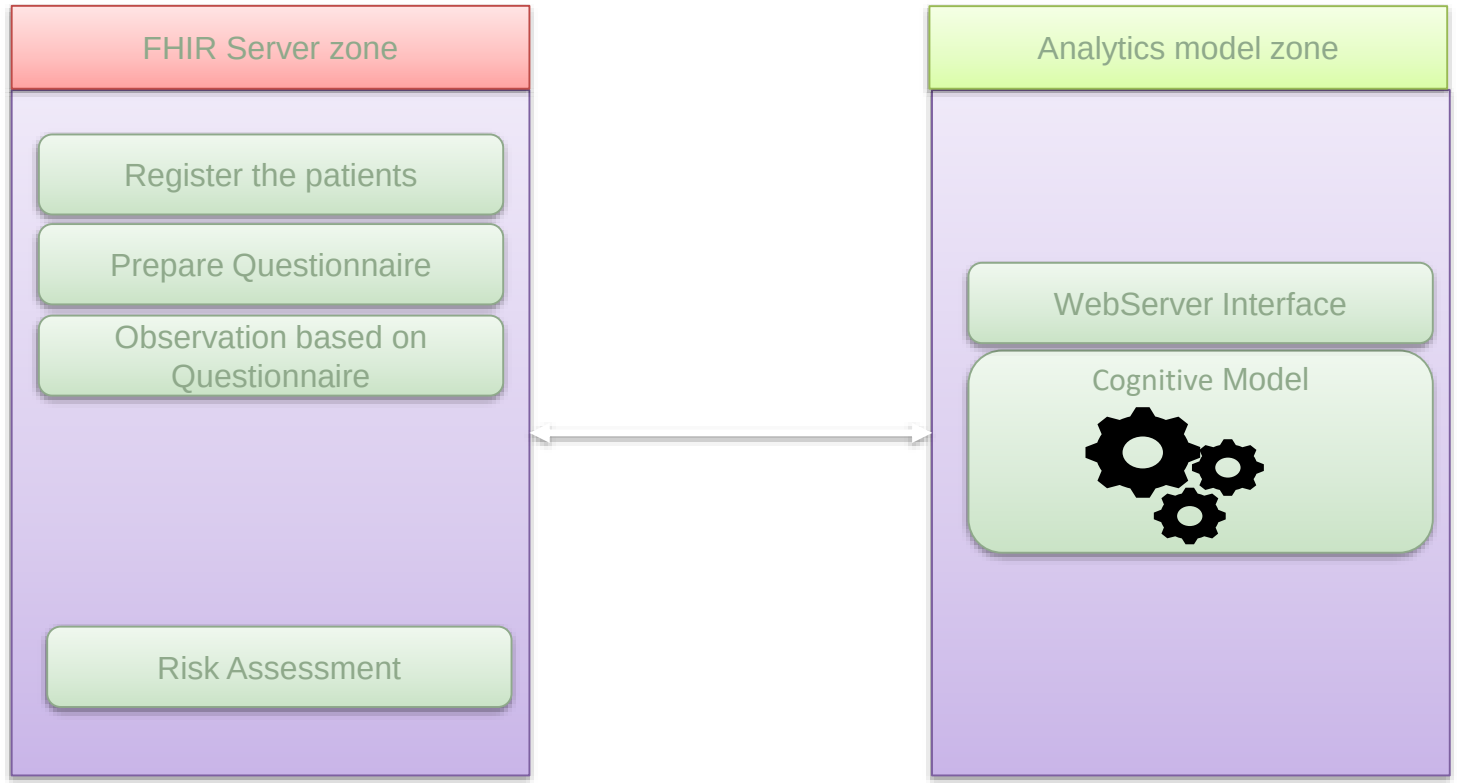
System Architecture (MVP)



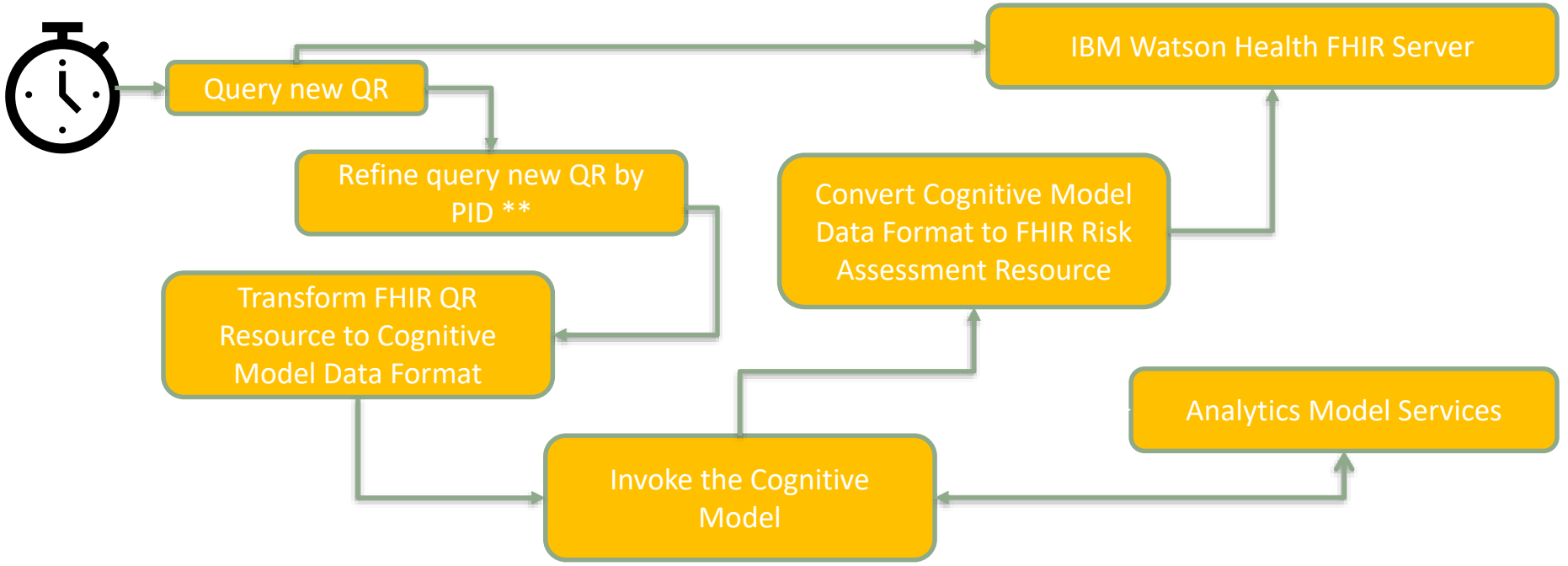
Data flow- Insight as Service Solution



Data flow – FHIR and Analytics Model



Data flow – Insight Services



*Questionnaire Response = QR

* *Patient Unique ID = PID

Lessons Learned

- Understand end user point of view.
- Real world data is the key.
- Fail fast and learn quick should be the mantra.

Notices and disclaimers

U.S. Government Users Restricted Rights — use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. **This document is distributed "as is" without any warranty, either express or implied. In no event, shall IBM be liable for any damage arising from the use of this information, including but not limited to, loss of data, business interruption, loss of profit or loss of opportunity.** IBM products and services are warranted per the terms and conditions of the agreements under which they are provided.

IBM products are manufactured from new parts or new and used parts. In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply."

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

- Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.
- References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.
- Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.
- It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer follows any law.

Notices and disclaimers continued

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products about this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. **IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a purpose.**

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

- IBM, the IBM logo, ibm.com and [names of other referenced IBM products and services used in the presentation] are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.