General

ID[1]		
Use case name	Revolutionizing clinical decision-making using artificial intelligence	
Application domain	Healthcare	
Deployment model	On-premise systems	
Status	PoC	
Scope[2]	To improve clinical decision-making and the accurate assessment of risks for individual patients of mental healthcare.	
Objective(s)	Halving the time to pre-screen patient records and giving more time for patient consultations	
Narrative	Short description (not more than 150 words)	The solution has halved the time for the preliminary assessment of patient records, increasing the time available for consultations
	Complete description	Traditional healthcare institutions have extensive paper archives built up over many years, representing a body of data that is often difficult to systematize, locate and interpret. The implementation of the electronic clinical history represents significant progress, facilitating analysis by providing information in an accessible and legible format with centralized access. However, in a “post-digitization” era, the information generated on a daily basis remains underused. “We have access to a vast quantity of data but it’s hard to extract meaningful information that helps us improve the quality of the care we provide,” explains Dr. Julio Mayol Martínez, Medical Director and Director of Innovation at the San Carlos Clinical Hospital. The solution has been developed on the back of the company’s in-depth research into applying advanced data analytics for healthcare applications. It has involved working in close collaboration with San Carlos Clinical Hospital’s expert clinicians, applying Fujitsu’s principles of co-creation to deliver tangible value in the field of mental healthcare. It deploys Fujitsu Laboratories’ state of the art anonymization technologies and Fujitsu’s data analytics technologies, tailored to meet the specific needs of the local Spanish healthcare sector. The technology will form the basis of a new Health Application Programming Interface (API), to be deployed in the Fujitsu cloud or delivered locally in a private cluster or cloud. The field trial took place over a 6-month period, involving senior mental health clinicians from San Carlos Clinical Hospital and a core database of over 36,000 anonymized patient records. Fujitsu leveraged this database to develop its Advanced Clinical Research Information System, based on its advanced artificial intelligence expertise including data analytics and semantic modelling. In the field trial, each of the clinicians looked at issues associated with the main diagnosis, any co-morbidities, potential risks from suicide, substance or alcohol abuse, and the patient history of using the healthcare system. Fujitsu’s system demonstrated a very

		high degree of risk assessment accuracy, with the system accelerating and systemizing the verification of key clinical data and identification of existing clinical problems. It achieved results of over 85 percent to identify suicide, alcohol and drug abuse risk.		
Stakeholders[3]				
Stakeholders' assets, values[4]				
System's threats and vulnerabilities[5]				
Key performance indicators (KPIs)	ID	Name	Description	Reference to mentioned use case objectives
AI features	Task(s)	Natural language processing		
	Method(s)[6]	Knowledge Graph		
	Hardware[7]			
	Topology[8]			
	Terms and concepts used[9]			
Standardization opportunities/ requirements				
Challenges and issues	The incorporation of many different types of data is revolutionizing the healthcare sector. The ability to apply semantic and analytic technologies to this heterogeneous mass of data, as well as traditional healthcare data, to discover hidden correlations, identify care patterns and support clinical decision-making is paving the way for a new generation of improved healthcare services			
Societal concerns	Description	Incorrect decision Unexplainable result		
	SDGs[10]	Good health and well-being for people		

Data (optional

Data characteristics	
Description	
Source[11]	
Type[12]	
Volume (size)	
Velocity (e.g. real time)[13]	
Variety (multiple datasets)[14]	
Variability (rate of change)[15]	
Quality[16]	

Process scenario (optional)

Scenario conditions					
No.	Scenario name	Scenario description	Triggering event	Pre-condition[17]	Post-condition[18]

Training (optional)

Scenario name	Training				
Step No.	Event[19]	Name of process/Activity[20]	Primary actor	Description of process/activity	Requirement

Specification of training data[21]	

Evaluation (optional)

Scenario name	Evaluation				
Step No.	Event[22]	Name of process/Activity[23]	Primary actor	Description of process/activity	Requirement

Input of evaluation[24]	
Output of evaluation[25]	

Execution (optional)

Scenario name	Execution				
Step No.	Event[26]	Name of process/Activity[27]	Primary actor	Description of process/activity	Requirement

Input of Execution[28]	
Output of Execution[29]	

Retraining (optional)

Scenario name	Retraining				
Step No.	Event[30]	Name of process/Activity[31]	Primary actor	Description of process/activity	Requirement

Specification of retraining data[32]	

References

References						
No.	Type	Reference	Status	Impact on use case	Originator/organization	Link
1	Brochure				Fujitsu	http://www.fujitsu.com/global/Images/CS_2017Apr_IdISSC_San-Carlos-Hospital_Eng_v.1.pdf
2	Brochure				Fujitsu	http://www.fujitsu.com/global/microsite/vision/customerstories/hospital-clinico-san-carlos/
3	Press Release				Fujitsu	http://www.fujitsu.com/uk/about/resources/news/press-releases/2015/pr-fle20161110.html

Footnote

[1] Leave this cell blank.

[2] The scope defines the limits of the use case.

[3] Stakeholder involved in the scenario - examples are: type of organization; customers, 3rd parties; end users; humans; environment; negative stakeholders (attackers, criminals, etc).

[4] Assets and values that are valuable to the stakeholders and at the risk of being compromised by the AI system deployment – examples can include competitiveness; reputation or trust; fairness; safety; privacy; stability; etc.

[5] Threats and vulnerabilities can compromise the assets and values above. Examples are: different sources of bias; incorrect AI system use; new security threats; challenges to accountability; new privacy threats (hidden patterns).

[6] AI method(s)/framework(s) used.

[7] Hardware system used.

[8] Topology is the study of geometric forms differentiated by intersection and bifurcation. The term is used for the graphic aspects network architectures.

[9] Terms and concepts listed here can be used to extend the work of WG 1 (AWI 22989 and AWI 23053) as necessary.

[10] The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a collection of 17 global goals set by the United Nations General Assembly. SDGs are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.
See URL for more details: http://www.undp.org/content/undp/en/home/sustainable-development-goals.html

[11] Origin of data, which could be from instruments, IoT, web, surveys, commercial activity, or from simulations.

[12] Structured/unstructured Images, voices, text, gene sequences, and numerical. Composite: time-series, graph-structured

[13] The rate of flow at which the data is created, stored, analysed, or visualized.

[14] Data from a number of domains and a number of data types. The wider range of data formats, logical models, timescales, and semantics complicates the integration of the variety of data.

[15] Changes in data rate, format/structure, semantics, and/or quality.

[16] Completeness and accuracy of the data with respect to semantic content as well as syntactical of the data (such as presence of missing fields or incorrect values)

[17] Describe which condition(s) should have been met before this scenario happens.

[18] Describe which condition(s) should prevail after this scenario happens. The post-condition may also define "success" or "failure" conditions.

[19] The event that triggers the step. This might be completion of the previous event.

[20] Action verbs should be used when naming activity.

[21] Training data can be further specified.

[22] The event that triggers the step. This might be completion of the previous event.

[23] Action verbs should be used when naming activity.

[24] Specify input of evaluation.

[25] Specify output of evaluation.

[26] The event that triggers the step. This might be completion of the previous event.

[27] Action verbs should be used when naming activity.

[28] Specify input of evaluation.

[29] Specify output of evaluation.

[30] The event that triggers the step. This might be completion of the previous event.

[31] Action verbs should be used when naming activity.

[32] Retraining data can be further specified.