Improving Radiation Planning Workflow using Technology

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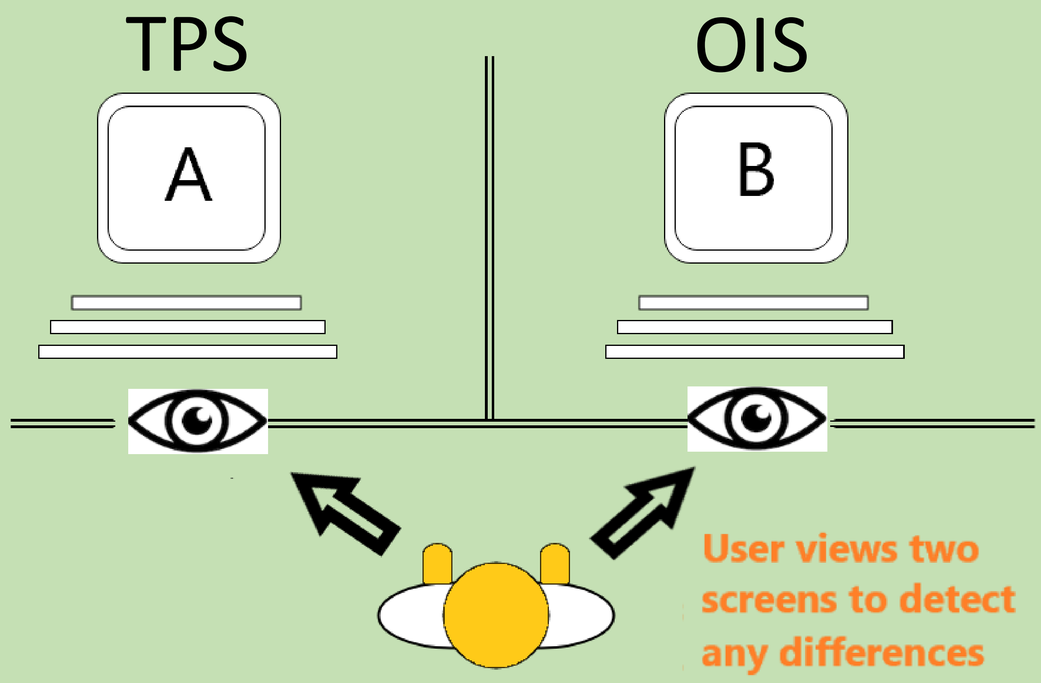
Background

In the Department of Radiation Oncology, the Dosimetrists will generate Radiation Plan that are used for treating cancer patients. These radiation plans are generated in the Treatment Planning System (TPS) and have to be manually transferred to the Oncology Information System (OIS). The manual process of transferring data from one system to another poses a risks that a wrong radiation plan transferred leading to a mistreatment. Currently, the Dosimetrist has to do **manual** visual inspections to ensure proper transfer. The aim of this project was to provide a more **automated** checking tool to ensure that the correct radiation plan has been transferred



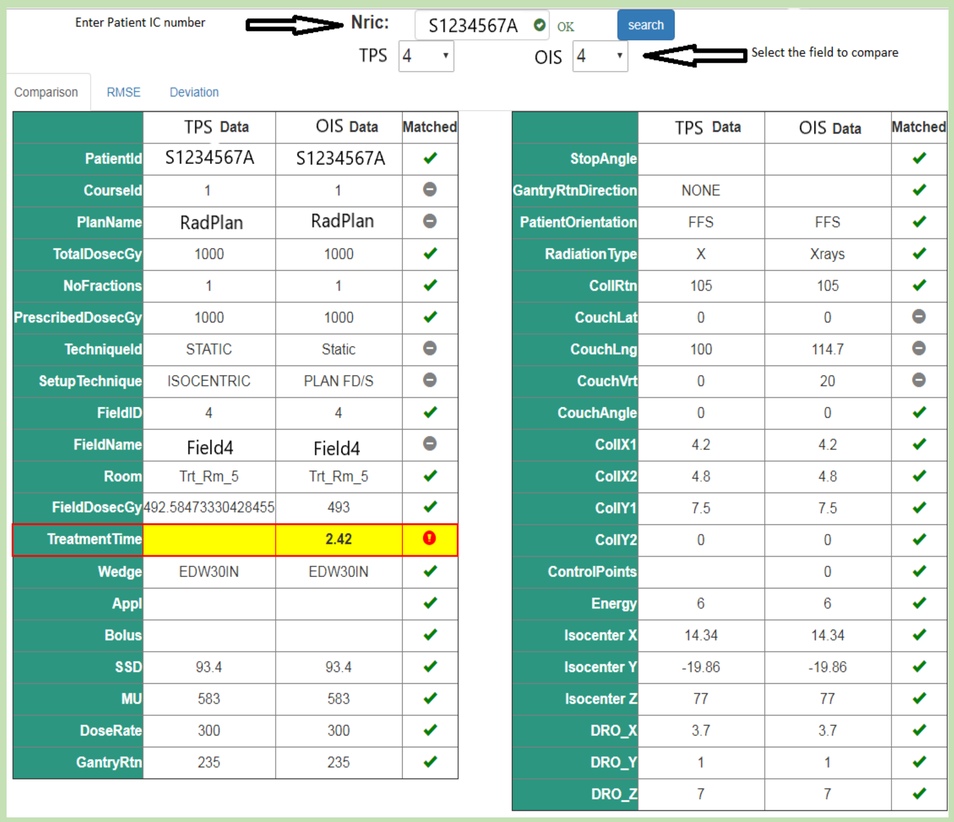
Methodology

Both the TPS and the OIS data are stored in a MSSQL database in their respective servers. SQL stored procedures/queries are written to query the radiation plan parameters from both TPS and OIS's database. The queried information will be pushed to a 3rd Party Application, where the radiation plan parameters from both TPS and OIS are compared.

The parameter doesnt match

The parameter matches

The parameter is not compared

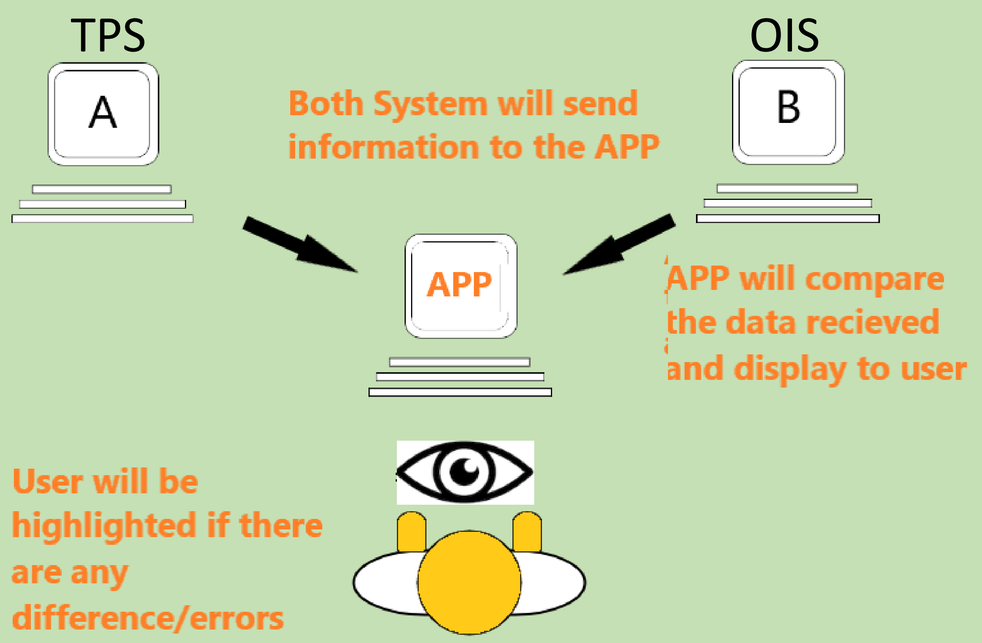


	TPS Data	OIS Data	Matched
PatientId	S1234567A	S1234567A	✔
CourseId	1	1	⊖
PlanName	RadPlan	RadPlan	⊖
TotalDosecGy	1000	1000	✔
NoFractions	1	1	✔
PrescribedDosecGy	1000	1000	✔
TechniqueId	STATIC	Static	⊖
SetupTechnique	ISOCENTRIC	PLAN FD/S	⊖
FieldID	4	4	✔
FieldName	Field4	Field4	⊖
Room	Trt_Rm_5	Trt_Rm_5	✔
FieldDosecGy	492.58473330428455	493	✔
TreatmentTime		2.42	!
Wedge	EDW30IN	EDW30IN	✔
Appl			✔
Bolus			✔
SSD	93.4	93.4	✔
MU	583	583	✔
DoseRate	300	300	✔
GantryRtn	235	235	✔

	TPS Data	OIS Data	Matched
StopAngle			✔
GantryRtnDirection	NONE		✔
PatientOrientation	FFS	FFS	✔
RadiationType	X	Xrays	✔
CollRtn	105	105	✔
CouchLat	0	0	⊖
CouchLng	100	114.7	⊖
CouchVrt	0	20	⊖
CouchAngle	0	0	✔
CollX1	4.2	4.2	✔
CollX2	4.8	4.8	✔
CollY1	7.5	7.5	✔
CollY2	0	0	✔
ControlPoints		0	✔
Energy	6	6	✔
Isocenter X	14.34	14.34	✔
Isocenter Y	-19.86	-19.86	✔
Isocenter Z	77	77	✔
DRO_X	3.7	3.7	✔
DRO_Y	1	1	✔
DRO_Z	7	7	✔

Results

The result of the 3rd Party Application allowed customizable checks on the plan parameters. When certain parameters are not matched between the TPS and OIS database, it will highlight the user. This has resulted in a higher catch rate of errors due to manual transfer of data between TPS and OIS.



Conclusion

With the modern technology advancements, IT solution such as 3rd party applications can be created to help automate checks and highlight to users when errors are present. Which in turn provide a safer environment for patient safety ensuring that they are treated with the correct radiation plan.