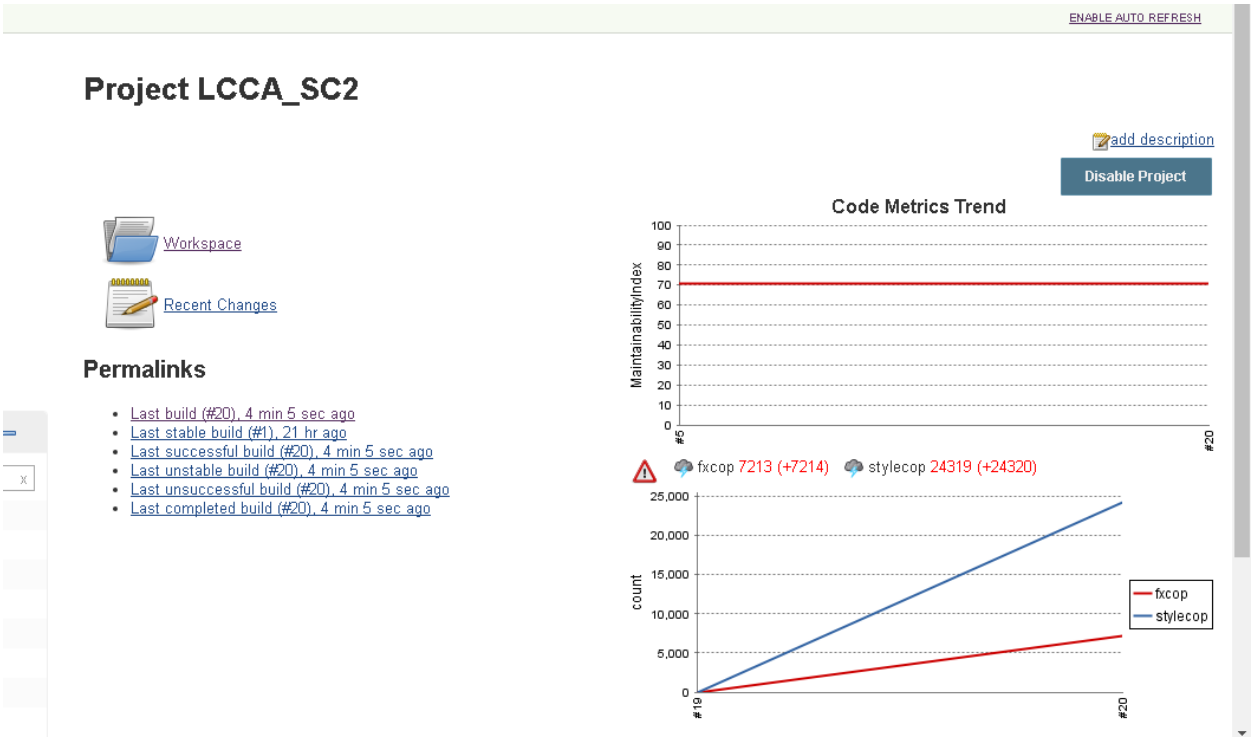
Project LCCA (SC2) – CI with Jenkins & MsBuild.

Things to note:-

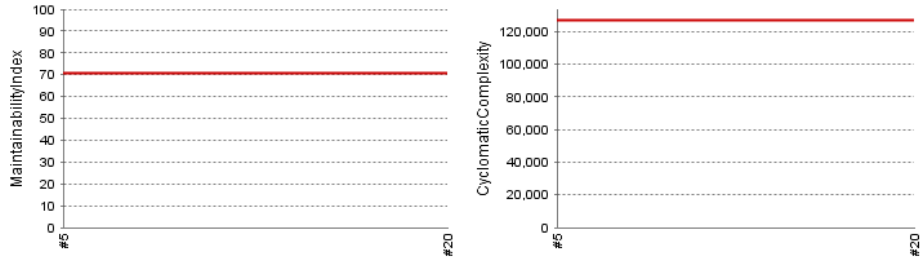
1. MsTest & CodeCoverage cannot be configured as test projects are not in shape to be included in the build.
2. PI (Partition Inspector) tool cannot be configured as it works against target database and NOT the DB scripts.
    a. This can be achieved if we able to deploy the database through CI. The DB deployment is a time consuming activity.
3. We need to do some changes in the Project files and get them checked-in into TFS to ensure smooth running of the CI tool. The changes required to run the tools are done locally on the machine.
4. The StyleCop & FxCop report is aligned with the agreed standard/rules with LCCA.
5. FxCop report includes all the relevent DLLs to be analyzed.
6. StyleCop currently include only 1 project from the solution as in Jenkin there is no option/plugin to report StyleCop violation from multiple project within solution.
    a. As a solution to this, a console app can be written to merge the violation in 1 and provide that as a source to Jenkin to display the trend.
7. Below are the reports which can be derived from CI.

Jenkin's Dashboard: - Trend chart of Code Metrics, FxCop & StyleCop.



Detail information of the code metrics analysis

Code Metrics Report



Code Metrics Summary

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(diff)
All Classes	71		127292		5522		36		318497	

Code Metrics by Module

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(di
LCCA.Clinical.RestServiceEntity.dll	93		413		14		2		413	
LCCA.Clinical.Security.dll	65		225		53		1		467	
LCCA.Clinical.UI.dll	71		20993		1675		6		57256	
LCCA.Clinical.Data.dll	59		21562		912		4		82804	

Metric Report continues….

Code Metrics by Module

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(diff)
LCCA.Clinical.RestServiceEntity.dll	93		413		14		2		413	
LCCA.Clinical.Security.dll	65		225		53		1		467	
LCCA.Clinical.UI.dll	71		20993		1675		6		57256	
LCCA.Clinical.Data.dll	59		21562		912		4		82804	
LCCA.Clinical.RestServiceProxies.dll	88		1383		188		3		2204	
LCCA.Clinical.AuditSystem.dll	46		6758		221		1		15261	
LCCA.Clinical.LegacyComponents.Client.dll	88		153		46		2		245	
LCCA.Clinical.APIBusiness.dll	59		6		10		1		23	
LCCA.Clinical.Auditing.dll	46		245		54		1		542	
LCCA.Clinical.Utility.dll	75		1749		200		6		3557	
LCCA.Clinical.Business.dll	73		42523		1348		3		118118	
LCCA.BusinessEntity.dll	94		31282		801		6		37607	

Metrics report continues showing further detail “Types wise”

Namespace Summary

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(diff)
LCCA.Clinical.RestServiceEntity.ADL	93		413		14		2		413	

Code Metrics by Type

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(diff)
Shift	93		11		4		1		11	
ADLPositioning	92		27		5		2		27	
BaseInfo	93		11		4		1		11	
ADL	92		29		5		2		29	
VitalsTemperature	92		27		5		2		27	
ADLEatingDrinking	92		35		4		2		35	
ADLPersonalHygiene	92		27		6		2		27	
ADLAuditRecord	92		37		4		1		37	
PersonalHygieneResult	94		9		5		1		9	
ADLAuditLogReport	94		7		1		1		7	
ADLBladderAndBowel	92		33		4		2		33	
PersonalHygieneSelected	94		7		2		1		7	
VitalsPulse	92		25		5		2		25	
VitalsBloodPressure	92		27		5		2		27	
VitalsRespiration	92		25		5		2		25	
PersonalHygiene	94		7		2		1		7	
ADLWeight	92		27		5		2		27	
[illegible]	93		17		4		1		17	

Deepest level report “By Member”

Type Summary

Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	DepthOfInheritance	(diff)	LinesOfCode	(diff)
Shift	93		11		4		1		11	

Code Metrics by Member

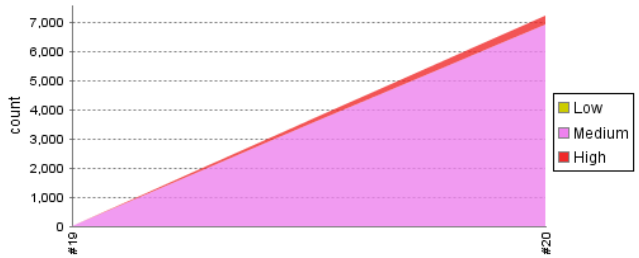
Name	MaintainabilityIndex	(diff)	CyclomaticComplexity	(diff)	ClassCoupling	(diff)	LinesOfCode	(diff)
ShiftId.get() : long	98		1		0		1	
ShiftDate.get() : string	98		1		0		1	
StartTime.set(TimeSpan?) : void	95		1		2		1	
Description.set(string) : void	95		1		0		1	
StartTime.get() : TimeSpan?	98		1		2		1	
Description.get() : string	98		1		0		1	
ShiftDate.set(string) : void	95		1		0		1	
Shift()	100		1		0		1	
ShiftId.set(long) : void	95		1		0		1	
IsCurrentShift.set(bool) : void	95		1		0		1	
IsCurrentShift.get() : bool	98		1		0		1	

Violation Reports:- All the static code analysis will be shown here as violation

Violations Report for build 20

Type	Violations	Files in violation
fxcop	7213	1359
stylecop	24319	191

fxcop



filename	l	m	h	number ↑
LCCACI/LCCA.Clinical/Entity/ProgressNotes.cs	0	9	0	9 (+9)
LCCACI/LCCA.Clinical/UI/Reports/Report.cs	0	9	0	9 (+9)
LCCA.BusinessEntity.TelephoneOrder	0	9	0	9 (+9)
LCCA.BusinessEntity.UIModel.MAROrder	0	9	0	9 (+9)
LCCA.Clinical.Business.Interfaces.ICAAWorkSheetManager	0	9	0	9 (+9)

FxCop next level detail

NOTE: Rule which is violating can be seen by hovering on the tool tip as shown below.

File: ProgressNotes.cs Lines 782 to 812

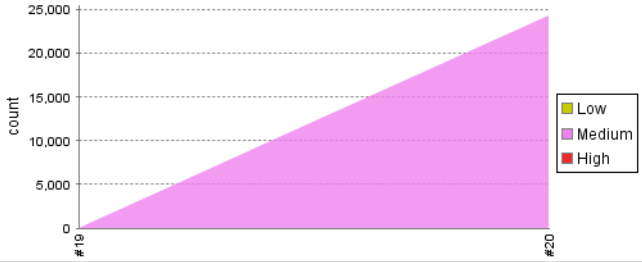
```
782         }
783
784         /// <summary>
785         /// Gets or sets the details of all Addendum's created for a progress note of a resident.
786         /// </summary>
787         /// <value>The Addendum.</value>
788         [Audit]
789         public Collection<ProgressNoteAddendum> Addendum
790         {
791             get { return this._addendum; }
```

Type	Class	Description
fxcop	Usage#CA2227	Properties that return collections should be read-only so that users cannot entirely replace the backing store. Users can still modify the contents of the collection by calling relevant methods on the collection. Note that the XmlSerializer class has special support for deserializing read-only collections. See the XmlSerializer overview for more information.

```
                                                progress notes created to a resident.
799         [Audit]
800         public List<ProgressNotes> ProgressNotesTimeList
801         {
802             get { return this._progressNotesTimeList; }
803             set { this._progressNotesTimeList = value; }
804         }
805
806         /// <summary>
```

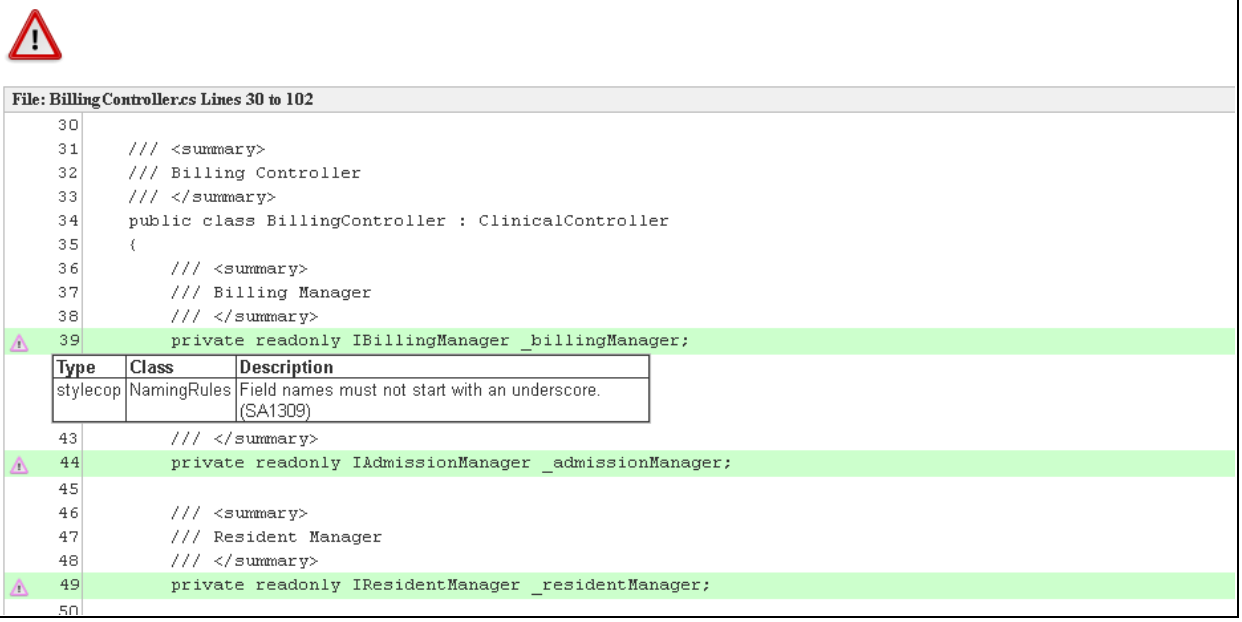
Style Cop Violation

stylecop



filename	l	m	h	number ↑
LCCACI/LCCA.Clinical/UI/Controllers/BillingController.cs	0	99	0	99 (+99)
LCCACI/LCCA.Clinical/UI/Controllers/LibraryICD9DiagnosisShortcutController.cs	0	95	0	95 (+95)
LCCACI/LCCA.Clinical/UI/Controllers/LibraryProgressNotesController.cs	0	95	0	95 (+95)
LCCACI/LCCA.Clinical/UI/Controllers/TransferSummaryController.cs	0	93	0	93 (+93)
LCCACI/LCCA.Clinical/UI/Controllers/LibraryPhysicianOrderCategoryController.cs	0	91	0	91 (+91)
LCCACI/LCCA.Clinical/UI/Controllers/ResidentHistoryControllerBase.cs	0	90	0	90 (+90)
LCCACI/LCCA.Clinical/UI/Controllers/LibraryPharmacyFrequencyController.cs	0	90	0	90 (+90)
LCCACI/LCCA.Clinical/UI/Controllers/VisitNoteRetractController.cs	0	9	0	9 (+9)
LCCACI/LCCA.Clinical/UI/Controllers/ReferralController.cs	0	884	0	884 (+884)
LCCACI/LCCA.Clinical/UI/Helpers/SofCare2QueryStringUrlRemapper.cs	0	86	0	86 (+86)
LCCACI/LCCA.Clinical/UI/Controllers/LibraryCustomMedicationController.cs	0	85	0	85 (+85)
LCCACI/LCCA.Clinical/UI/Controllers/VitalsController.cs	0	85	0	85 (+85)

NOTE: Similar to FxCop report you will be taken to code where hovering on warning icon would display the rule violated.



File: BillingController.cs Lines 30 to 102

```
30
31      /// <summary>
32      /// Billing Controller
33      /// </summary>
34      public class BillingController : ClinicalController
35      {
36          /// <summary>
37          /// Billing Manager
38          /// </summary>
39          private readonly IBillingManager _billingManager;
```

Type	Class	Description
stylecop	NamingRules	Field names must not start with an underscore. (SA1309)

```
43          /// </summary>
44          private readonly IAdmissionManager _admissionManager;
45
46          /// <summary>
47          /// Resident Manager
48          /// </summary>
49          private readonly IResidentManager _residentManager;
50
```