

# An Unexpected Journey: SQL Server 2000 to 2014

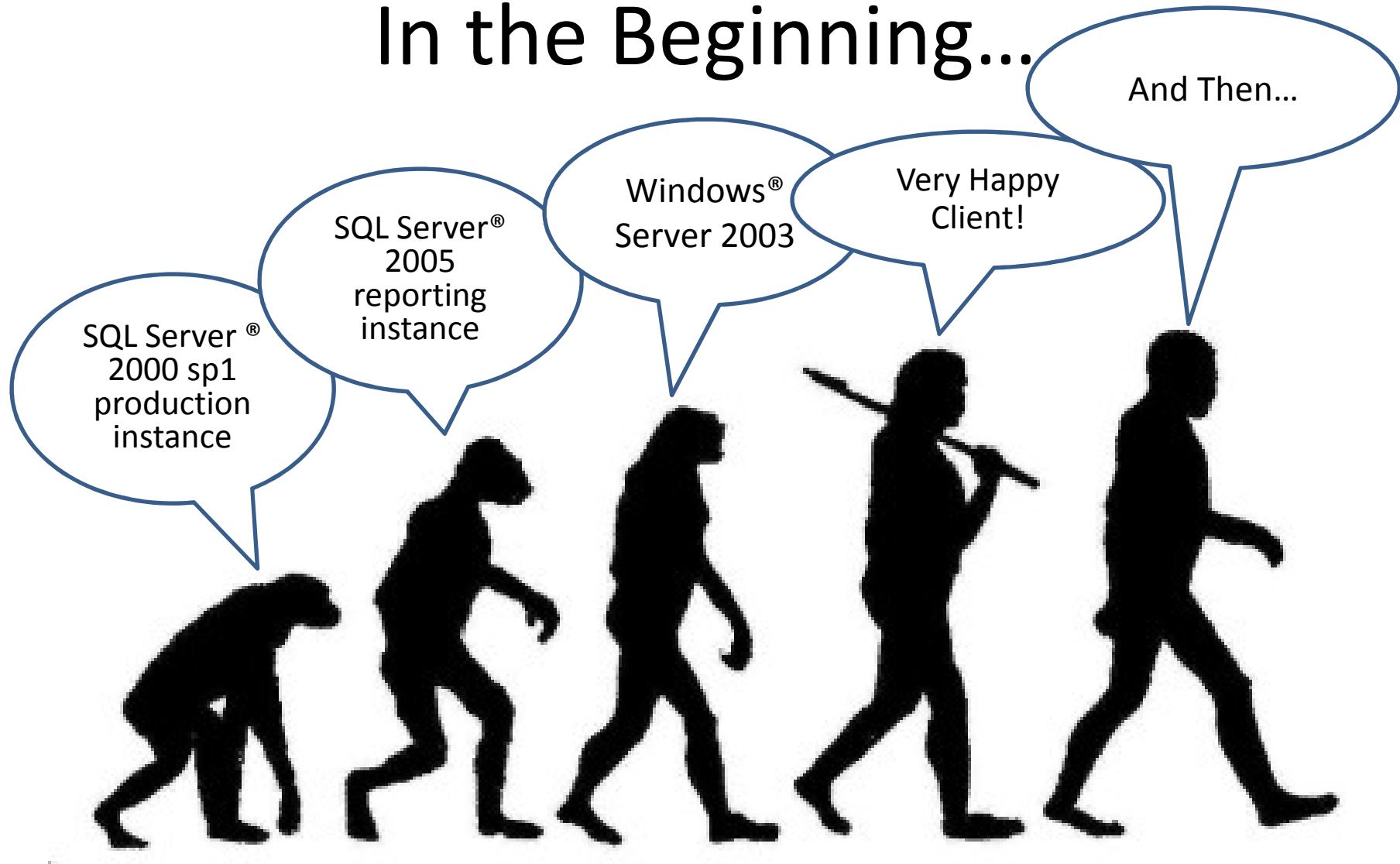
*OR*

*How to Give Yourself Brain Damage  
in One Easy Lesson*

*Michelle Poolet, MCIS,  
Zachman-Certified™ Enterprise Architect*



# In the Beginning...





# Out of the West, a Gathering of Clouds

Windows 2003 Support dropped  
(SQL Server 2000 support ended previous April...)





No Recourse – Upgrade or Die!





# A True But Misleading Statement...

Hosting provider offers upgrade for a pittance...but what's missing?

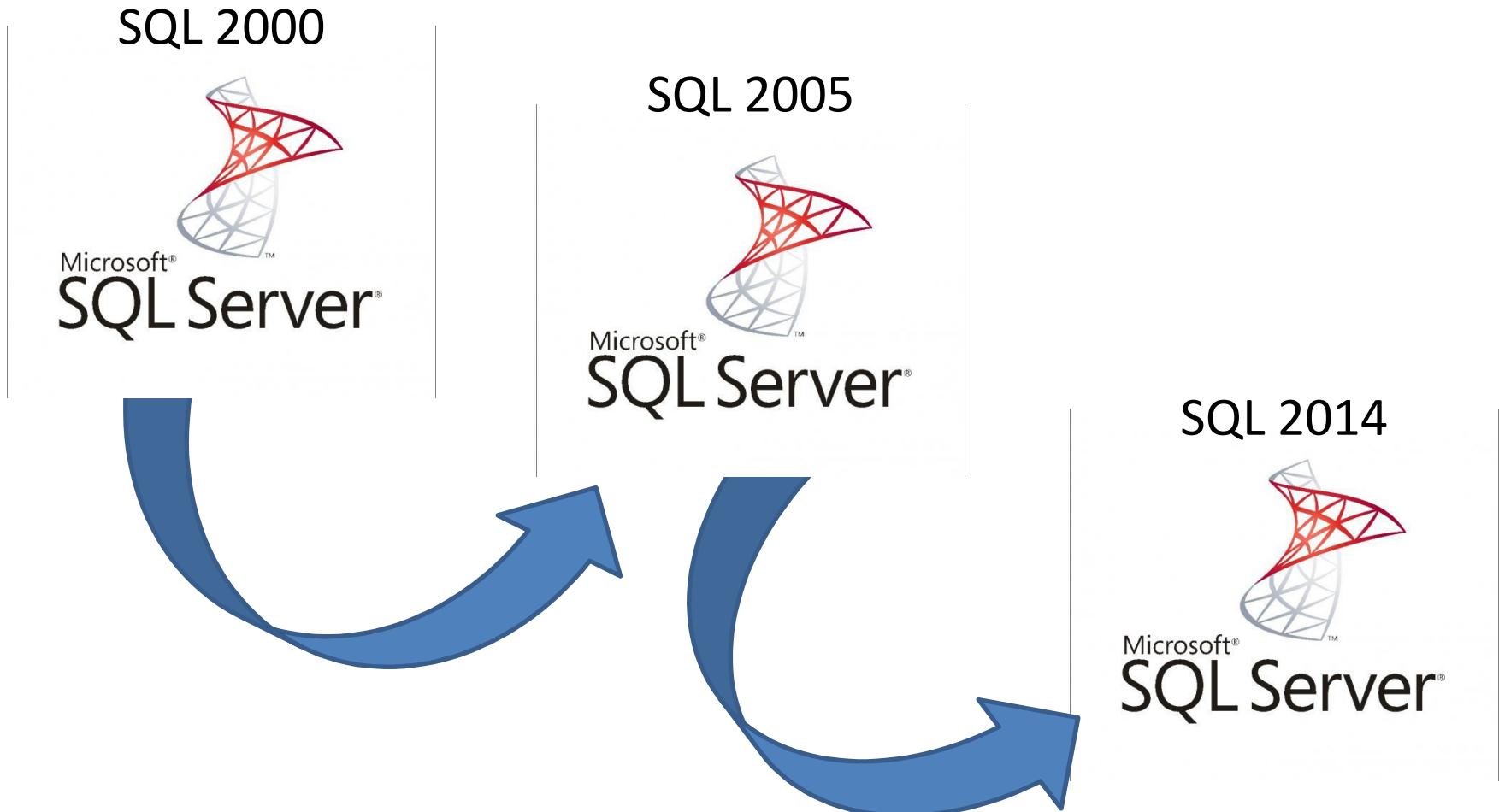
# We Develop A Plan

Task Name	Milestone	Duration	Start Date	Finish Date
Upgrade Task – Build the Windows Environment				
Install and configure Operating System (Windows 2012R2 or higher)				
Install any Windows service packs needed				
Install and configure any additional software needed...				
Anti-virus software				
Microsoft Office				
Browsers (alternate) - Firefox, Chrome				
Adobe Reader				
Other				
Install .NET Framework (4.0/4.1 for SQL Server 2014)				
Download and install SQL Server 2000 service pack 4				
Download ISO image for SQL Server 2005, in preparation for install				
Download ISO image for SQL Server 2014, in preparation for install				
Install SQL Server 2005 on Target #1				
If Target #1 instance is on the same physical server as Source, 1) must be a named server, and 2) must be assigned some port other than 1433				
Install SQL Server 2005 service pack 4				
Ensure that SQL Server 2005 Upgrade Advisor is available				
Install SQL Server 2014 (on Target #2)				
Install any current service packs on SQL Server 2014 (on Target #2)				
Ensure that SQL Server 2014 Upgrade Advisor* is available (may also need to install on Target #1)				
Ensure that your Dev team knows about and are willing to use the SQL Server 2012-2014 Upgrade Assistant, available from <a href="http://www.scalabilityexperts.com/tools/downloads.html">http://www.scalabilityexperts.com/tools/downloads.html</a>				
Ensure that there is a reliable connection between the two Target machines (will need for fast file transfers), test thoroughly				
Ensure that there is storage available on Targets #1 and #2 for all files				
Copy most recent backup files from Source to Target #1				
Move Windows environment to ready to go	VRC			

# THERE IS NO PLAN B



# You Can't Get There from Here



# Measure 4x, Cut Once

Planning = 80%  
Execution = 20%



The Effort Required for Everything Else Will Exceed 100%



# The First Questions

# If...Then...Else



# Inventory the Window Servers?

Most recent service packs applied?

Most current .NET Framework installed?

External operations (file transfers, etc)?

Scheduled/maintenance tasks/timing?

Security logins, roles, etc?

Encryption packages?

*Ask me about a free Windows & network*

*Inventory report...*



**↑  
milestones**

There Are 11

# M1: Prep the Source SQL Server

1.1.0	Upgrade Task – Inventory & Prep the Source Database	Milestone	Duration	Start_Date	Finish_Date	Pre
1.1.1	Get login/passwords to Source SQL Server (SQL Server 2000), store in safe place ("login safe")					
1.1.2	Get list of Source aliases used in production recreate on Target servers #1 and #2					

Inventory the entire SQL environment

Apply any missing SQL Server service packs

Use SQL Server Upgrade Advisor

Apply “Breaking Changes” (MSDN, Technet)

*Ask me about a free SQL Server inventory report...*

# Is The Database Active?

-- create a table to hold the results...

-- create a scheduled job to run periodically...

BEGIN TRAN

Insert into IsDatabaseActive

select db\_name(dbid), spid, lastwaittype, waittime, uid,  
      loginname, login\_time, last\_batch, program\_name,  
      hostprocess, net\_address, net\_library, getdate()

from master..sysprocesses

where dbid > 4

COMMIT

# M2: Prep the Target SQL Servers

1.1.0	Upgrade Task – Transition From Target #1 (2005) to Target #2 (2014)	Milestone	Duration	Start Date
1.1.1	Restore databases onto Target #1, confirm they are accessible			

Install SQL Server 2005/2008/2014

For the SQL Server...

upgrade Model database

check & test server-level properties

# M3: Prep the Databases

1.1.0	Upgrade Task – Transition From Target #1 (2005) to Target #2 (2014)	Milestone	Duration	Start Date
1.1.1	Restore databases onto Target #1, confirm they are accessible			

MSDB – limit number of log records on source SQL Server  
For Each User Database:

- backup/transfer file/restore, note timing
- match db userids – logins (remove orphans)
- resolve db object ownership for non-dbo
- run Update Advisor, make changes, test
- make any “breaking changes”, test
- take unused dbs offline, transfer files

# M4: Prep the Data

1.1.0	Upgrade Task – Transition From Target #1 (2005) to Target #2 (2014)	Milestone	Duration	Start Date
1.1.1	Restore databases onto Target #1, confirm they are accessible			

DBCC CheckDB with Data\_Purity

sp\_RefreshView

sp\_UpdateStatistics

sp\_UpdateUsage

*Ask me about the T-SQL CODE that I used...*

# M5: Prep the Database Code

1.1.0	Upgrade Task – Transition From Target #1 (2005) to Target #2 (2014)	Milestone	Duration	Start Date
1.1.1	Restore databases onto Target #1, confirm they are accessible			

Stored procs, triggers, CLR code, etc...

deprecated instructions, maintenance plans, DTS packages, other Upgrade Advisor recommendations?

any “breaking changes”?

make changes and test, test, test

# M6: Test Database Environment

1.2.0	Upgrade Task – Test the Database Environment (Target Server #2)	Milestone	Duration	Start_Date	Finish_Date	Prere
1.2.1	Database A					
1.2.1.1	1. Identify/document key functional areas and expected behavior baseline.					

For each Database...

Identify key function/behaviour

Test key function/behaviour

Pass/fail

Seriously, FOR EACH & EVERY DATABASE...

# M7: Test Apps Environment

1.3.0	Upgrade Task – Test the APPLICATIONS Against Target Server #2	Milestone	Duration	Start_Date	Finish_Date	Prereq
1.3.1	Application A -					
1.3.1.1	1. Identify/document key functional areas and expected behavior baseline.					
1.3.1.2	2. Test key functionality against expected results					

For each Application...

Identify key function/behaviour

Test key function/behaviour

Pass/fail

Seriously, FOR EACH APP that you want to use...

# M8: Rollback Plan

1.5.0	Upgrade Task - Rollback/Fallback Plan	Milestone	Duration	Start_Date	Finish_Date	Prerequ
<b>1.5.1</b>	<b>Pre-DNS Switchover</b>					
1.5.1.1	Roll back to old production server, reestablish connections					

MUST HAVE

Pre-DNS

Post-DNS

# M9: Freeze Plan

1.6.0	Upgrade Task - FREEZE PLAN	Milestone	Duration	Start Date	Finish Date	Prereq
1.6.1	Document freeze plan - include data files and reports					

Document Steps

Notify Players

Set Schedule

# M10: Execute Plan

1.7.0	EXECUTE THE MIGRATION PLAN	Milestone	Duration	Start_Date	Finish_Date	Pre
	Task 1 - the Execution, pre-DNS switch					
1.7.1	Freeze Change Notification Goes Out Coordinate with Source Location maintenance schedule - stop backups and any other					

## Pre-DNS

Post “we will re-open...” web page

Switch SQL Server 2000 dbs to read-only if possible

Execute upgrade/migration

## Post-DNS

Test, test, test the apps, web & otherwise

Take 2000-version databases offline

Re-open for business

# M11: Clean Up

1.9.0	POST-MIGRATION TASKS, THE CLEAN-UP	Milestone	Duration	Start_Date	Finish_Date	Prereq
1.9.1	<b>Close out process to get data back/removed from Source Platform</b>					
1.9.2	Source Location exit strategy - papers filed, contracts signed.					

Source databases, operations closed down

Take backups/baselines for new SQL Server

Wrap-up/post mortem team briefing

Team thank-you and recognition, MVP awards

# 4 Takeaways

Have your Rollback Plan ready.

Whatever your Project Manager says, multiply by 3!

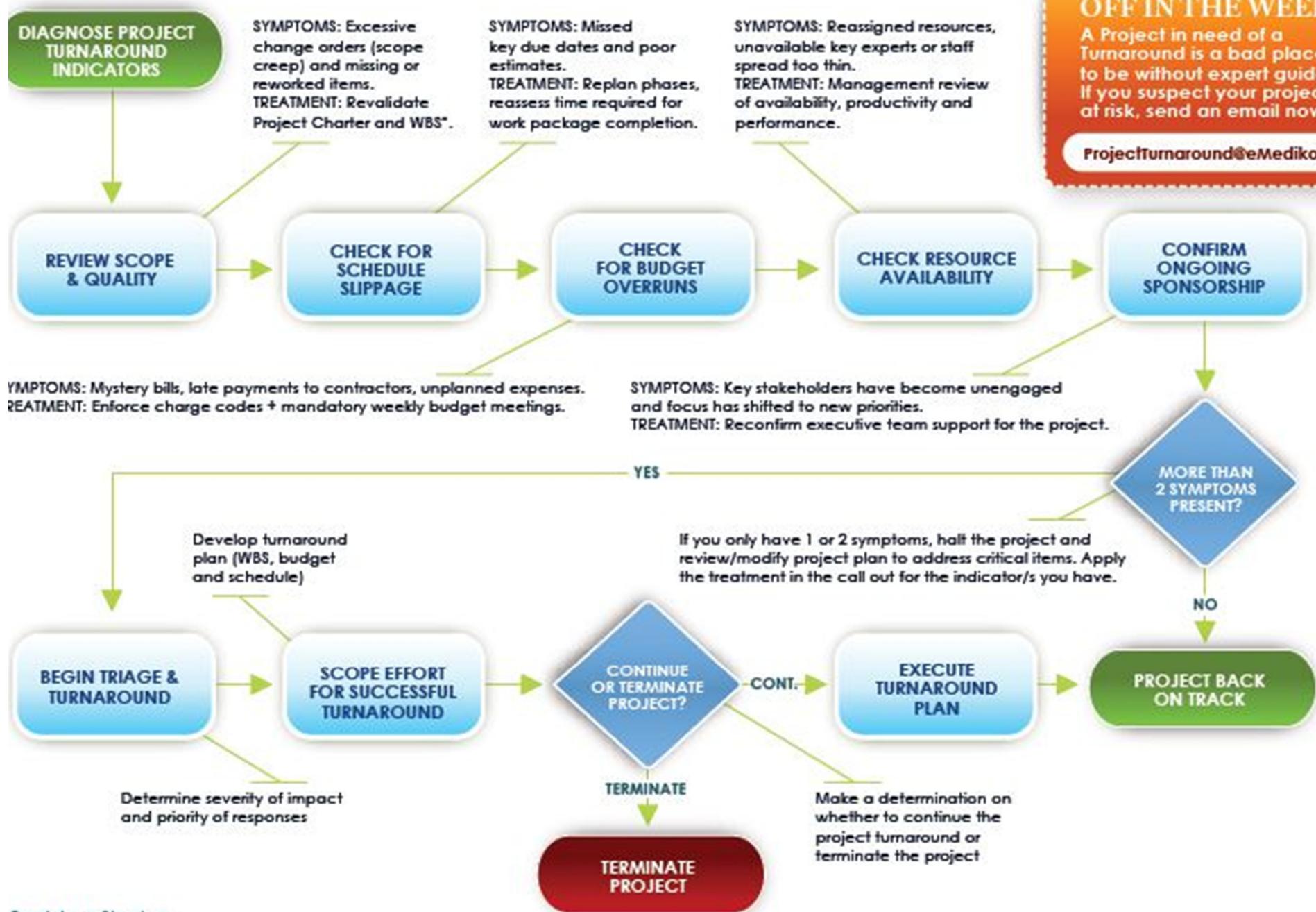
Team communication trumps project documentation.

Learn the 5 signs of a project being in trouble and the 20-minute risk management meeting you should have at every milestone.

## PROJECT GOING OFF IN THE WEEDS?

A Project in need of a Turnaround is a bad place to be without expert guidance. If you suspect your project is at risk, send an email now!

[ProjectTurnaround@eMedikon.com](mailto:ProjectTurnaround@eMedikon.com)



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Q & A

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# *The SQL Server 2000-2014 Migration Toolkit:*

*Windows & network inventory report;*

*SQL Server inventory report;*

*T-SQL code to test the data;*

*SQL Server Database Migration checklist (Excel)*

*Project turnaround map*

Test SAN throughput performance

<http://thesanguy.com/2012/09/25/san-performance-metrics/>

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Upgrade From	Supported Upgrade Path
SQL Server 2005 Express	SQL Server 2005 Standard/Enterprise SQL Server 2008 Express SQL Server 2008 Standard/Enterprise SQL Server 2008 R2 Express  SQL Server 2008 R2 Standard/Enterprise SQL Server 2012 Express* SQL Server 2012 Standard/Enterprise* SQL Server 2014 Express**  SQL Server 2014 Standard/Enterprise**
SQL Server 2005 Standard/Enterprise	SQL Server 2008 Standard/Enterprise SQL Server 2008 R2 Standard/Enterprise SQL Server 2012 Standard/Enterprise*  SQL Server 2014 Standard/Enterprise**
SQL Server 2008 Express	SQL Server 2008 Standard/Enterprise SQL Server 2008 R2 Express  SQL Server 2008 R2 Standard/Enterprise SQL Server 2012 Express* SQL Server 2012 Standard/Enterprise* SQL Server 2014 Express**  SQL Server 2014 Standard/Enterprise**
SQL Server 2008 Standard/Enterprise	SQL Server 2008 R2 Standard/Enterprise  SQL Server 2012 Standard/Enterprise*  SQL Server 2014 Standard/Enterprise**
SQL Server 2008 R2 Express	SQL Server 2008 R2 Express  SQL Server 2008 R2 Standard/Enterprise SQL Server 2012 Express* SQL Server 2012 Standard/Enterprise* SQL Server 2014 Express**  SQL Server 2014 Standard/Enterprise**
SQL Server 2008 R2 Standard/Enterprise	SQL Server 2012 Standard/Enterprise*  SQL Server 2014 Standard/Enterprise**
SQL Server 2012 Express	SQL Server 2012 Standard/Enterprise* SQL Server 2014 Express**  SQL Server 2014 Standard/Enterprise**
SQL Server 2012 Standard/Enterprise	SQL Server 2014 Express**  SQL Server 2014 Standard/Enterprise**
SQL Server 2014 Express	SQL Server 2014 Standard/Enterprise
SQL Server 2014 Standard/Enterprise	N/A

# SQL Server Upgrade Version Compatibility Chart

\* SQL Server 2012 supports upgrade from the following versions of SQL Server:

SQL Server 2005 SP4 or later

SQL Server 2008 SP2 or later

SQL Server 2008 R2 SP1 or later

\*\* SQL Server 2014 supports upgrade from the following versions of SQL Server:

SQL Server 2005 SP4 or later

SQL Server 2008 SP3 or later

SQL Server 2008 R2 SP2 or later

SQL Server 2012 SP1 or later