

**An introduction to Zero Touch Nodes**

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**CAPITA**



## What is Zero-Touch?

Zero-Touch Importing refers to a simple point-and-click method for importing C# libraries. Dynamo will read the public methods of a .dll file and convert them to Dynamo nodes. You can use Zero-Touch to develop your own custom nodes and packages, and to import external libraries into the Dynamo environment.

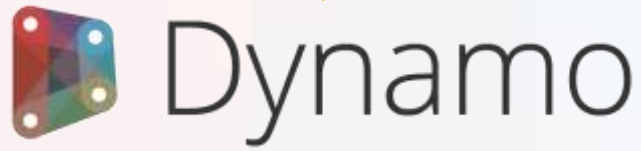
[http://dynamoprimer.com/10\\_Packages/10-5\\_Zero-Touch.html](http://dynamoprimer.com/10_Packages/10-5_Zero-Touch.html)

Dynamo Primer section 10.5



## Revit Coding

Dynamo vs C#



Advantages	Disadvantages
Quick	Unmanaged
Very little learning needed	Requires knowledge
Visual	No role out



## Visual C#

Advantages	Disadvantages
Managed and robust	Knowledge / learning needed
Can deploy	Not available to all
Links to Windows	Complex



## Code vs Node

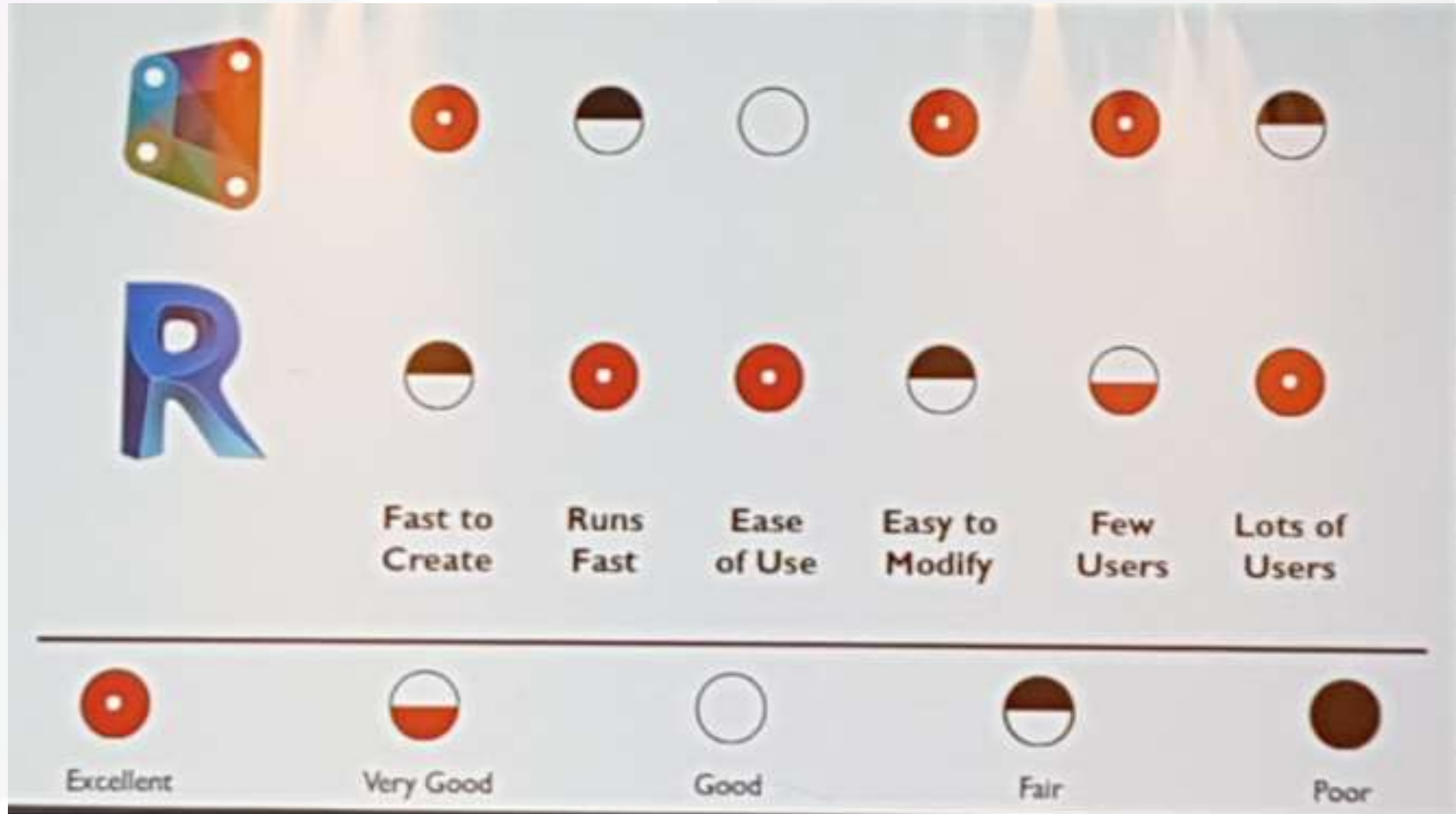
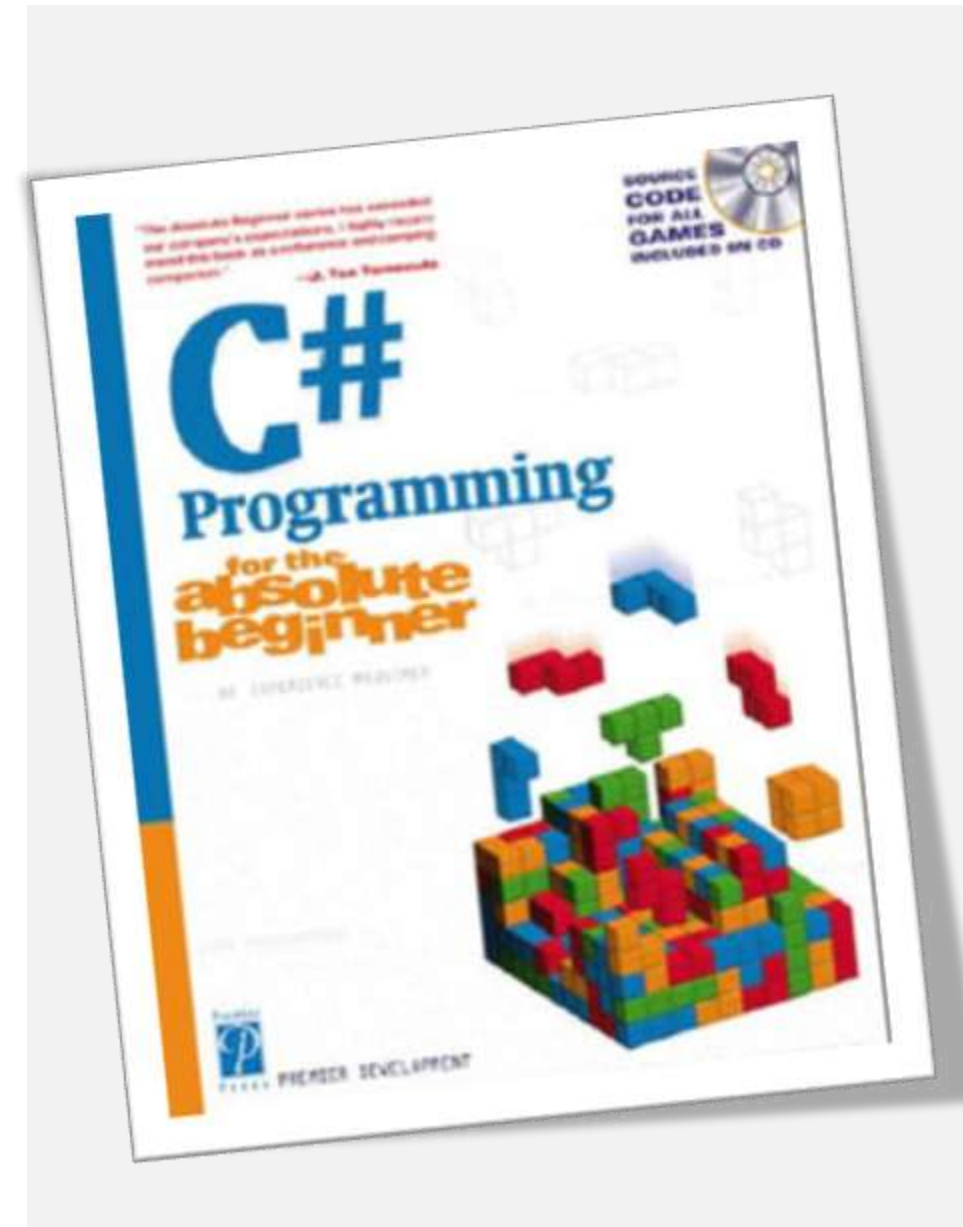


Image from @theBIMsider taken at RTC North America. Presentation and slide by @MichaelKilkelly



# The learning stage

- What should I have?
- Basic understanding of C#  
Microsoft C# Programming for the Absolute Beginner  
[http://knot805.eti.pg.gda.pl/po/books/Microsoft%20C%23%20Programming%20For%20The%20Absolute%20Beginner%20\(2002\).pdf](http://knot805.eti.pg.gda.pl/po/books/Microsoft%20C%23%20Programming%20For%20The%20Absolute%20Beginner%20(2002).pdf)
- Revit API SDK  
The SDK is included in every Revit product. There are two ways to install the Revit SDK:  
From the main page of the Revit installer, click “Install Tools and Utilities” and choose “Revit Software Development Kit”.  
Alternatively, you can also find the SDK in the extraction folder, under:  
<extraction folder>\support\SDK\RevitSDK.exe
- My first Revit API tutorial  
<http://usa.autodesk.com/adsk/servlet/index?siteID=123112&id=16777469>
- Time, patience, determination & lots of trial and error
- Visual Studio Revit addin wizard  
<http://thebuildingcoder.typepad.com/blog/2014/05/add-in-wizards-for-revit-2015.html>  
(Change options to use “managed compatibility” mode in VS 2013)



## Example 1



```
1  using System;
2  using System.Collections.Generic;
3  using System.Linq;
4  using System.Text;
5  using System.Threading.Tasks;
6  using System.Diagnostics;
7
8  namespace DynamoHelloWorld
9  {
10     public class HelloWorldClass
11     {
12         public static string HelloWorldOut()
13         {
14             return "Hello World";
15         }
16     }
17 }
18
```





## Example 2

```
1 using System;
2 using System.Collections.Generic;
3 using System.Linq;
4 using System.Text;
5 using System.Threading.Tasks;
6 using System.Diagnostics;
7
8 namespace DynamoHelloWorld
9 {
10     public class HelloWorldClass
11     {
12         public static string HelloWorldOut()
13         {
14             return "Hello World";
15         }
16         public static string HelloWorldIn(string HelloWorld)
17         {
18             return string.Join(" ", HelloWorld, "Hello World");
19         }
20         public static double Times2(double input)
21         {
22             return (input * 2);
23         }
24         public static string UserName()
25         {
26             return Environment.UserName;
27         }
28         public static void Website ()
29         {
30             Process.Start("www.ukdug.co.uk");
31         }
32         public static void Manual()
33         {
34             Process.Start(@"C:\Users\mike.turpin\Documents\transfer\My Docs\BIM Documents\Standards\British Standards\PAS1192-2.pdf");
35         }
36         public static string InputManual(string filepath)
37         {
38             Process.Start(filepath);
39             return filepath;
40         }
41     }
42 }
43
```



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## How does it work?

```
public static string HelloWorldIn(string HelloWorld)  
{  
    return string.Join(" ",HelloWorld,"Hello World");  
}
```

HelloWorldClass.HelloWorldIn	
HelloWorld	string

```
public static string HelloWorldIn(string HelloWorld)  
{  
    return string.Join(" ",HelloWorld,"Hello World");  
}
```

HelloWorldClass.HelloWorldIn	
HelloWorld	string

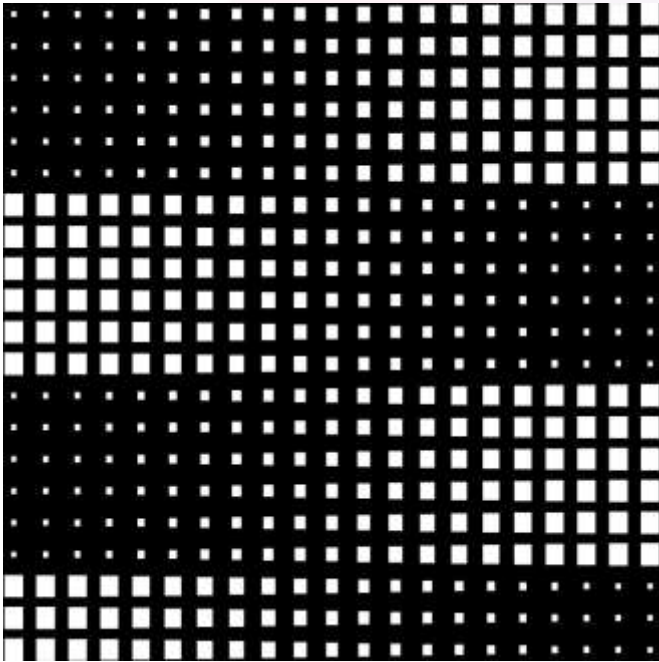




## Example 3

```
23 }
24 public static string UserName()
25 {
26     return Environment.UserName;
27 }
28 public static void Website ()
29 {
30     Process.Start("www.ukdug.co.uk");
31 }
32 public static void Manual()
33 {
34     Process.Start(@"C:\Users\mike.turpin\Documents\transfer\My Docs\BIM Documents\Standards\British Standards\PAS1192-2.pdf");
35 }
36 public static string InputManual(string filepath)
37 {
38     Process.Start(filepath);
39     return filepath;
40 }
41 public static string UKDUGString (string a, string b, string c)
42 {
43     return string.Join(" ", a, b, c);
44 }
45 }
46 }
47 }
```





From this.....

.....to this

