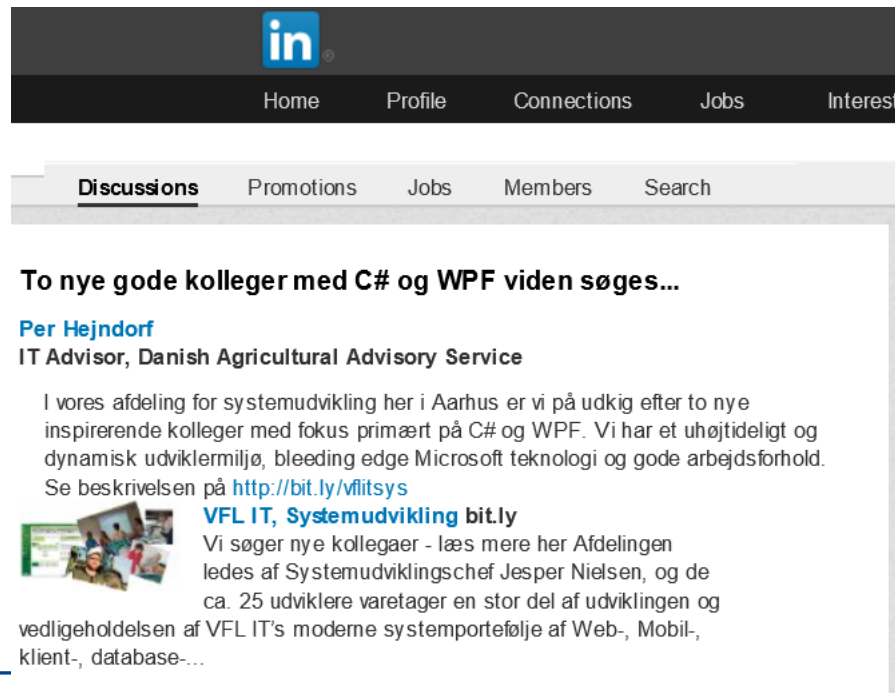


# Introduction to Windows Presentation Foundation



The screenshot shows a LinkedIn interface. At the top is the LinkedIn logo and navigation links: Home, Profile, Connections, Jobs, and Interest. Below this is a secondary navigation bar with links: Discussions, Promotions, Jobs, Members, and Search. The main content area features a discussion titled "To nye gode kolleger med C# og WPF viden søges...". The author is Per Hejndorf, an IT Advisor at Danish Agricultural Advisory Service. The post text describes a search for colleagues in the Aarhus system development department, focusing on C# and WPF. It mentions a dynamic development environment, bleeding edge Microsoft technology, and good working conditions. A link to a description is provided: <http://bit.ly/vflitsys>. Below the text is a small image of a group of people. To the right of the image is a link to "VFL IT, Systemudvikling bit.ly". The post continues with text about seeking new colleagues, mentioning the department is led by System Development Manager Jesper Nielsen, and that approximately 25 developers handle a large part of the development and maintenance of VFL IT's modern system portfolio, including Web-, Mobile-, client-, and database-...

**To nye gode kolleger med C# og WPF viden søges...**

**Per Hejndorf**  
IT Advisor, Danish Agricultural Advisory Service

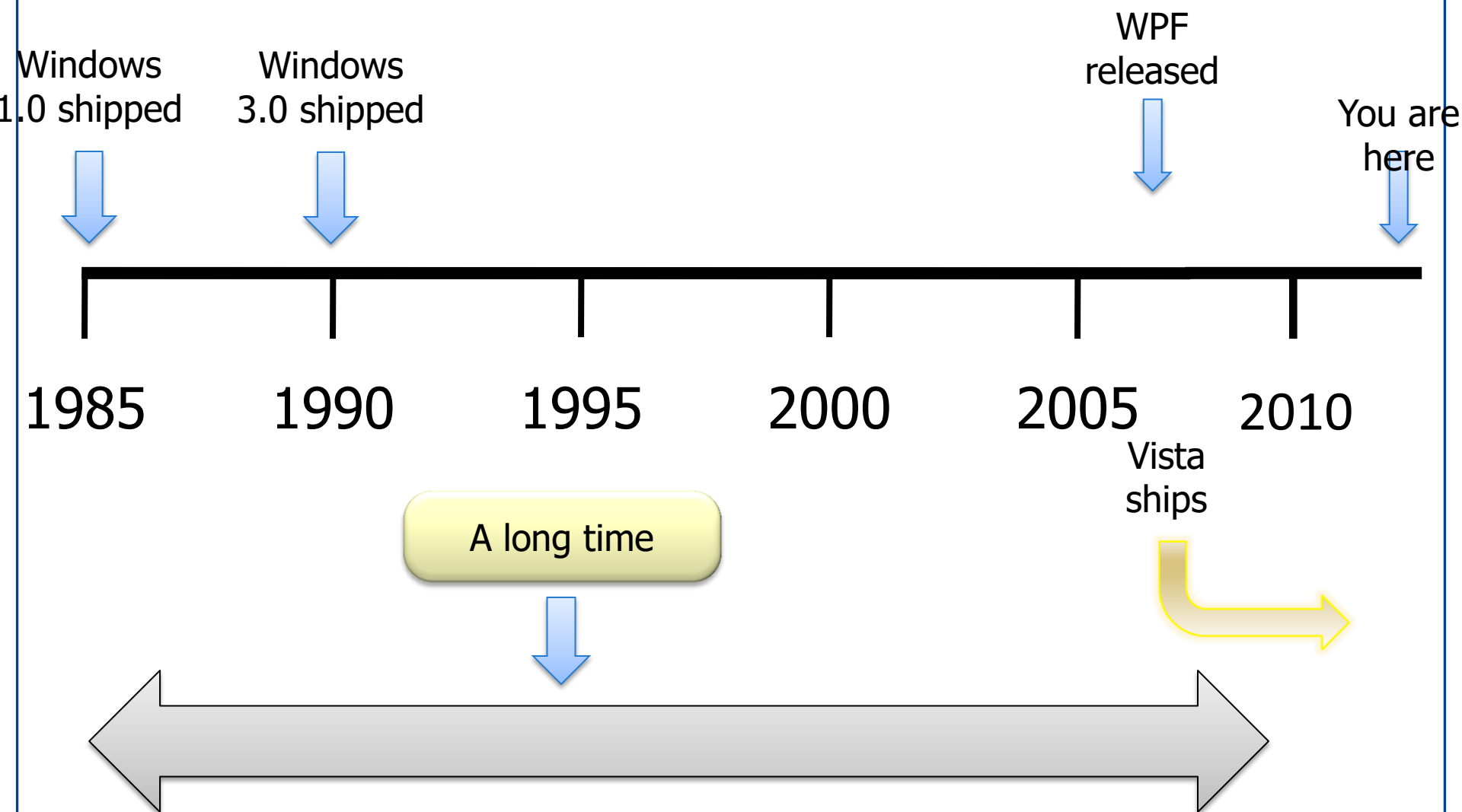
I vores afdeling for systemudvikling her i Aarhus er vi på udkig efter to nye inspirerende kolleger med fokus primært på C# og WPF. Vi har et uhøjtideligt og dynamisk udviklermiljø, bleeding edge Microsoft teknologi og gode arbejdsforhold. Se beskrivelsen på <http://bit.ly/vflitsys>

**VFL IT, Systemudvikling bit.ly**

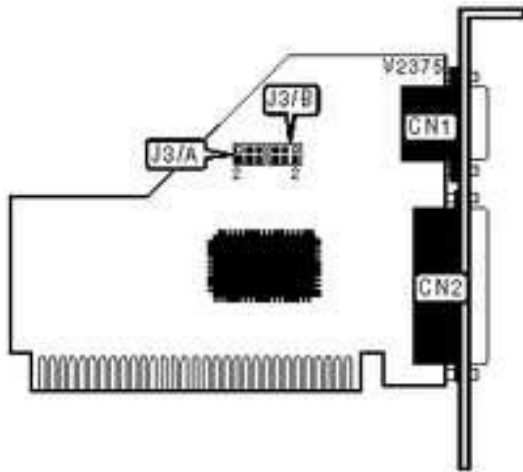
Vi søger nye kollegaer - læs mere her Afdelingen ledes af Systemudviklingschef Jesper Nielsen, og de ca. 25 udviklere varetager en stor del af udviklingen og vedligeholdelsen af VFL IT's moderne systemportefølje af Web-, Mobil-, klient-, database-...

# A new UI platform

## ...but why?



# Video Cards



1985



2005

# New Expectations



Hello



Hello!



Hello



Hello

# Integration

- In 2000 Microsoft had 5 major UI platforms:
  - User32/GDI32
    - The original Windows UI engine
  - Ruby
    - Visual Basic's UI model (build on top of User/GDI)
  - Trident
    - ~ MSHTML.dll the UI engine used by browsers (a HTML specific engine)
  - Windows Forms
    - A managed-code API on top of User32 and GDI+ (a successor to GDI32)
  - DirectX
    - Low level UI engine aimed for Games.
- WPF: a single integrated solution (the dream – not really the case yet)

Win32

HTML

DirectX

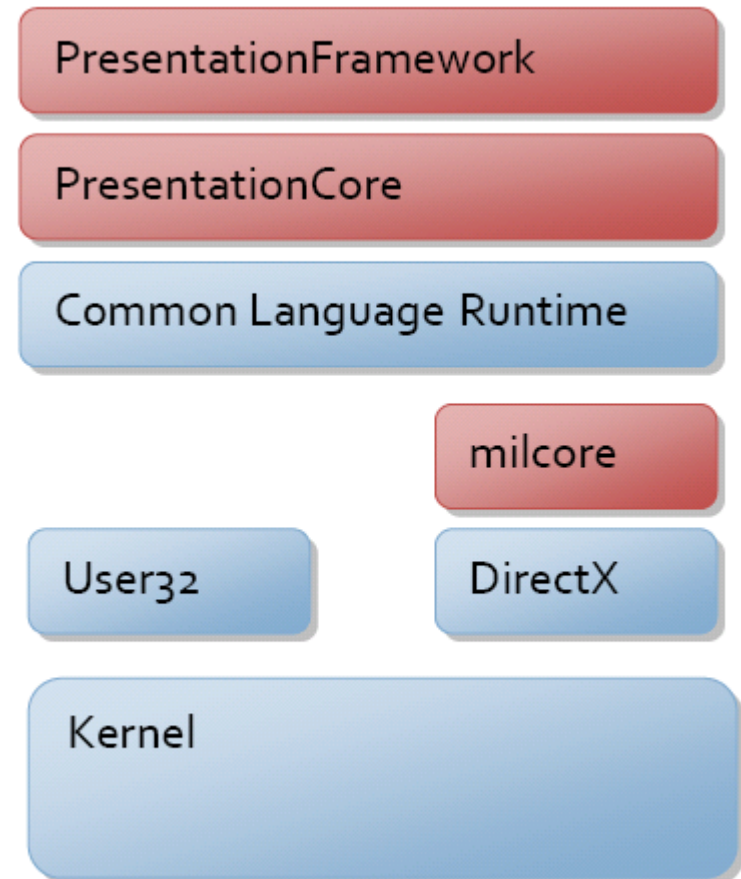
WPF

# WPF history

- Microsoft started the WPF project in 2001
  - Mission:  
*To build a unified presentation platform that could eventually replace User32/GDI32, Ruby, Trident and Windows Forms while enabling the new scenarios that customers were demanding in the presentation space.*
  - The project was called Avalon at that time
- In 2003 WPF had a major redesign
  - Since then there have been a more steady development
- The first release of WPF was in 2007
- WPF is the work of 5 years by more than 300 people.

# WPF and the OS

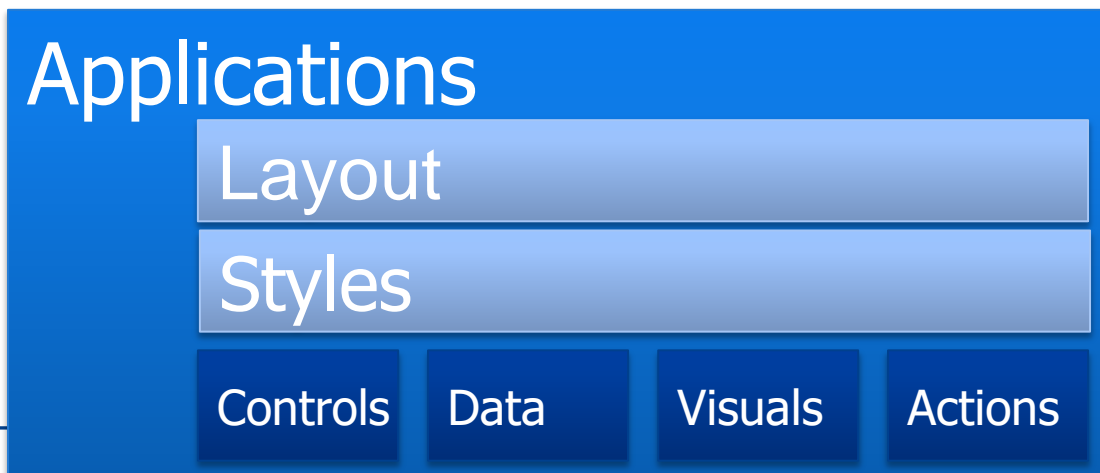
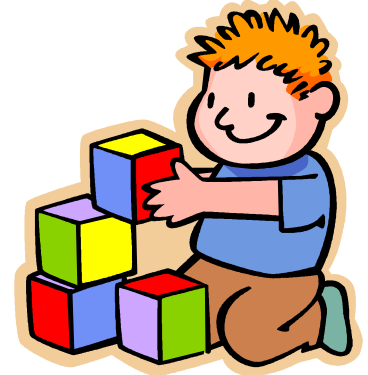
- The primary WPF programming model is exposed through managed code.
- The major components of WPF are illustrated in the figure.
  - The red sections of the diagram (PresentationFramework, PresentationCore, and milcore) are the major code portions of WPF.
  - Of these, only one is an unmanaged component – milcore.
  - Milcore is written in unmanaged code in order to enable tight integration with DirectX.
  - All display in WPF is done through the DirectX engine, allowing for efficient hardware and software rendering.





# WPF Framework Concepts

- Applications
  - The top level architecture of an WPF application.
- Controls
  - Are the fundamental building blocks of user interface in WPF applications.
- Layout
  - Different types of panels are used to manage the layout of controls and other UI elements in a window.
- Visuals
  - Text, 2D and 3D graphics, animation, video and audio
- Data
  - Data sources and how to bind them to controls.
- Actions
  - Events, commands and triggers.
- Styles
  - The styling system enables a clear separation of the visual appearance of the UI and programmatic structure of the application.



# XAML: .NET Markup

- WPF uses XAML (an XML dialect) to separate the visual appearance of the UI and the programmatic structure of the application.

```
<Button x:Name="myButton"  
        FontSize="24"  
        FontFamily="Candara"  
        Foreground="DarkRed">  
  
    _Click me!  
</Button>
```

You can create  
a button by  
xaml

```
Button myButton = new Button();  
myButton.FontSize = 24;  
myButton.FontFamily =  
    new FontFamily("Candara");  
myButton.Foreground =  
    Brushes.DarkRed;  
myButton.Content = "_Click me!";
```

Or by code

Click me!

# WPF vs. Windows Forms

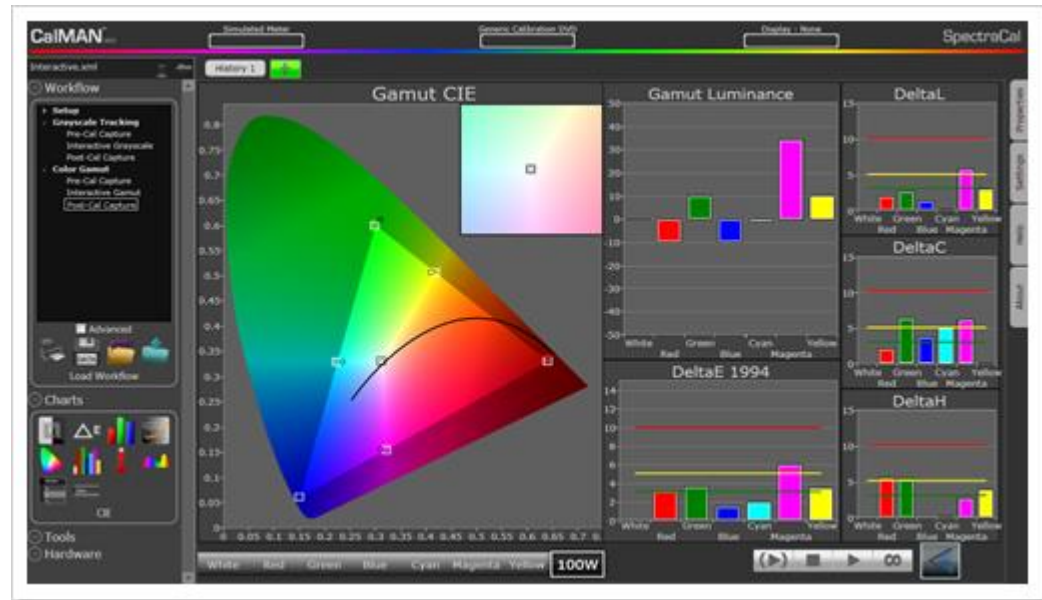
- The foundation of WPF is very solid
  - dependency properties, routed events and XAML.
- And there are lots of cool features in WPF
  - particularly with graphics and animation.

# What's New In WPF 4.5

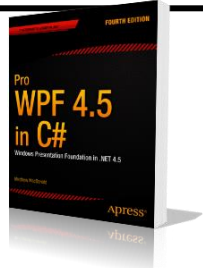
- Ribbon control
- Improved performance when displaying large sets of grouped data
- New features for the VirtualizingPanel
- Binding to static properties
- Accessing collections on non-UI Threads
- Synchronously and Asynchronously validating data
- Automatically updating the source of a data binding
- Binding to types that Implement ICustomTypeProvider
- Retrieving data binding information from a binding expression
- Checking for a valid DataContext object
- Repositioning data as the data's values change (Live shaping)
- Improved Support for Establishing a Weak Reference to an Event
- New methods for the Dispatcher class
- Markup Extensions for Events

# Real Apps Build with WPF

- Inside Microsoft
  - **Visual Studio** - only the GUI, the compilers are build with C++.
  - Expression Suite – only the GUI.
  - WebMatrix
  - And many internal apps.
- Outside Microsoft
  - AutoCAD 2010
  - HyperDrive
  - Nero 9
  - Roxio Creator 2009
  - TurboTax 2010
  - CalMAN
  - Metrotwit (Twitter client)
  - Nemo Documents (DK)
  - You can find other examples in the BookOfWPF:  
<http://10rem.net/blog/2010/02/10/the-book-of-wpf>



# Books on WPF

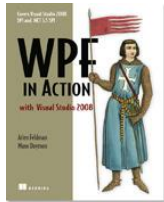


**Pro WPF 4.5 in C#**, 4rd Edition

By Matthew MacDonald

Publisher: Apress

ISBN: 978-1-4302-4366-3



**WPF in Action** with Visual Studio 2008

By Arlen Feldman and Maxx Daymon

Publisher: Manning Publications Co.

ISBN: 1933988223

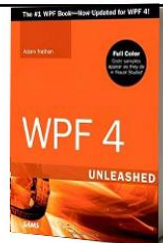


**Essential Windows Presentation Foundation (WPF)**

By Chris Anderson *the chief architect of WPF*

Publisher: Addison-Wesley Professional

ISBN-13:9780321374479 *Focused on concepts behind WPF*



**Windows Presentation Foundation Unleashed (WPF)**

By Adam Nathan

Publisher: Sams

ISBN-13: 978-0672331190



**Programming WPF** Second Edition

By Chris Sells, Ian Griffiths

Publisher: O'Reilly

ISBN 13: 9780596510374

# Online Sources

- Walkthrough: Getting Started with WPF  
[https://msdn.microsoft.com/en-us/library/vstudio/ms752299\(v=vs.100\).aspx](https://msdn.microsoft.com/en-us/library/vstudio/ms752299(v=vs.100).aspx)