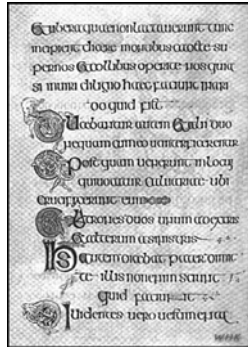




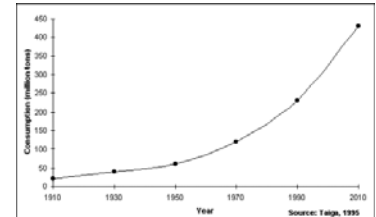
From book of Kells 800 BC

Will the paperless office always be a myth?



The Paperless Myth

- For a very long time people have predicted that offices will *soon* be paperless
- It has not happened.
- In fact paper consumption has increased more-or-less in parallel with computer use!
- Why is this?



<http://www.iied.org/smg/pubs/rethink3.html>

Paper

- Integrated into work practices – almost inseparable in some cases.
- Physical
 - Its presence tell us things about it (type of book)
 - Can be spread about, ordered stacked, have post-its attached

Ink Repository

- Mostly paper is an ink repository
- We can write on it
- We can read from it.
- Sometimes we do both at the same time

Paper's affordances

- Always 'on'
- No applications, file formats, artificial limitations
- Informal
- Has a physical presence – which makes it easier to
 - Scan
 - Navigate flexibly
 - View multiple documents at one time
 - Annotation
 - Interleave reading and writing

Active Reading

- Most people prefer to read off paper
- This used to be blamed on poor screens
- But it is more about *active* reading
 - Following along with a finger or pen
 - Annotating
 - Emphasis – highlight, underline, circle
 - Notes – explain, clarify, question
 - Correct – cross out, insert, reorder
- Reading an annotated document is quite different to reading the same document un-annotated

Digital documents

- Virtual rather than physical
- Easy version control
- Easy replication
- Easy editing
- No geographic restrictions
- Quite likely, more permanent
 - because of multiple copies

Digital affordances

- Easy editing
 - But annotation (a la Word review) is a poor substitute for *red ink*
- Non linear possible (hyper-links, OO programs)
- Search

What is missing in digital environments

- Support of work practises
- What do we need to support human work
 - Portable affordable hardware
 - Large work surfaces
 - Interaction devices
 - Suitable software

An Exemplar assignment marking as an activity

- Tasks
 - Collect the assignments
 - Write the marking rubric
 - Pre-scan the assignment (order?)
 - Teachers do this, but markers don't
 - Detailed marking of each assignment
 - Reading, annotating, executing (programs), scoring
 - Recording scores against the rubric
 - Total scores and save in a file
 - Return work to students
 - Sometimes produce work for moderation

Doing it paperless

- Make a marking rubric (easy)
- Electronic Drop-box (already exists)
- Replicate a stack of papers
- Easy navigation between papers
- Easy annotation and recording of scores
- Easy running of programs
- Easy return of work

Stack of papers



Submissions - 39 students	
<input type="checkbox"/>	agt002 - 3/06/2005 8:59:58 p.m.
<input type="checkbox"/>	awu001 - 2/06/2005 5:27:37 p.m.
<input type="checkbox"/>	awan015 - 3/06/2005 6:16:04 p.m.
<input type="checkbox"/>	bmeg002 - 3/06/2005 1:13:20 p.m.
<input type="checkbox"/>	bqi002 - 3/06/2005 10:42:21 p.m.
<input type="checkbox"/>	cche211 - 2/06/2005 9:24:08 p.m.
<input type="checkbox"/>	<i>chsa021 - 3/06/2005 7:22:49 p.m.</i>
<input type="checkbox"/>	clu052 - 3/06/2005 10:30:49 p.m.
<input type="checkbox"/>	clsa005 - 3/06/2005 5:28:30 p.m.
<input type="checkbox"/>	dyan024 - 2/06/2005 5:14:48 p.m.
<input type="checkbox"/>	efug001 - 3/06/2005 10:46:43 p.m.
<input type="checkbox"/>	ehar060 - 3/06/2005 4:52:01 p.m.
<input type="checkbox"/>	gche043 - 3/06/2005 10:54:41 p.m.
<input type="checkbox"/>	gnot002 - 3/06/2005 10:54:41 p.m.
<input checked="" type="checkbox"/>	gwan031 - 2/06/2005 6:26:52 p.m.
<input type="checkbox"/>	hhu059 - 2/06/2005 6:26:52 p.m.
<input type="checkbox"/>	hvo001 - 3/06/2005 9:51:52 p.m.
<input type="checkbox"/>	hwu065 - 3/06/2005 9:18:31 p.m.
<input type="checkbox"/>	hzha123 - 2/06/2005 4:45:17 p.m.
<input type="checkbox"/>	jche117 - 3/06/2005 9:34:29 p.m.
<input type="checkbox"/>	j039 - 3/06/2005 6:20:53 p.m.
<input type="checkbox"/>	juu036 - 3/06/2005 1:13:50 a.m.
<input type="checkbox"/>	mcho061 - 3/06/2005 8:56:30 p.m.
<input type="checkbox"/>	ml051 - 3/06/2005 4:38:00 p.m.
<input type="checkbox"/>	mln010 - 3/06/2005 10:47:58 p.m.
<input type="checkbox"/>	nmw016 - 3/06/2005 1:10:44 a.m.
<input type="checkbox"/>	qqa0005 - 3/06/2005 8:30:14 a.m.
<input type="checkbox"/>	sher038 - 3/06/2005 8:30:14 a.m.
<input type="checkbox"/>	slw014 - 3/06/2005 6:51:50 n.m.

- Each student listed
- Italic when opened
- Ticked when finished

- Double tap – opens student

- Should
 - Allow reordering
 - Show total when finished?

Annotation

- Ink anywhere
- Eraser
- No clipboard

```

lineCalculatorForm.vb
Public Class lineCalculatorForm
    Inherits System.Windows.Forms.Form
    (Windows Form Designer Generated Code)

    Private Sub calculateButton_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles calculateButton.Click
        Dim aDate As Date
        aDate = #6/6/2005#
        If txtDateDue.Text = True Then
            If childCheckBox = True Then
                txtFineTextBox.Text = "0.25"
            Else
                txtFineTextBox.Text = "0.40"
            End If
        Else
            ErrorProvider.SetError(lblCurrentDateLabel, "valid date in the form dd/mm/yy")
        End If
    End Sub
End Class
    
```

Comments?

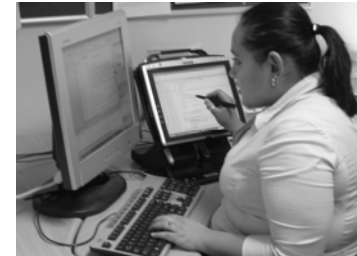
now validate

Cal number of days!

created on keyboard

Multiple documents

- Running programs
- Dual displays
 - Tablet for inking
 - Other for IDE



Scoring

- Ink entry
- Needs recognition
- Handwriting takes more space

Marking Schedule for 7.700 Assignment 6

Section	Description	Mini...	Maxi...	Rece...
1	assignment 1			
1	Introduction	0	10	50
2	Research	0	30	30
3	Discussion	0	30	25
4	References	0	10	10
5	Grammar, Spelling	0	20	18
Section 7 Total			100	57
Grand Total		0	100	97

10

Post marking

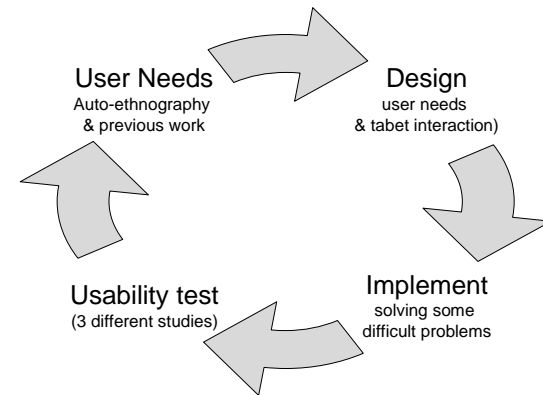
- Save grades to xml file
 - From where they can be imported into most things (like cecil, excel
- Make pdf of mark schedule and annotated assignment
- Email to student

It is paperless!

- We use it for marking compsci 280
- We don't print anything
- But students get comments on their work



It is an example of practising HCI



What doesn't it do

- Afford spreading the assignments around the desk top
 - But what if we had a “real desktop” computer
- Work inside the programming IDE
- Different file formats

Is paperless possible?

- Completely paperless
 - Not for a while yet
- Reducing the use of paper
 - Absolutely!
- We just have to understand more about how we use it!
- And have the hardware and software to support it.