

# Putting the user into YOUR user interface

*Case study of an effective user interface redesign*

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Arthur Fink Consulting

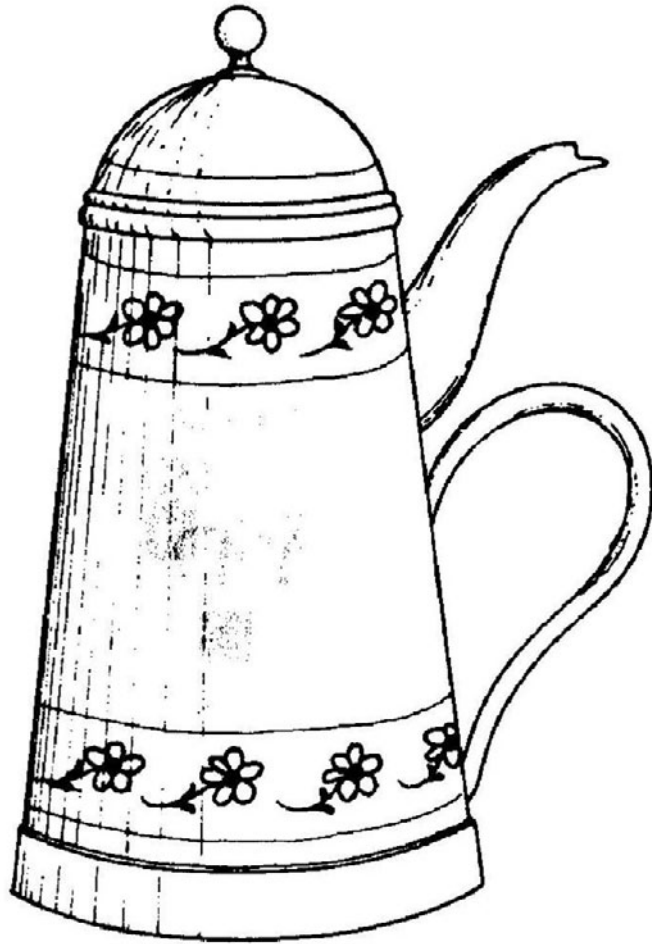
**Carl Pritchard**  
Franchise Technologies, Inc.



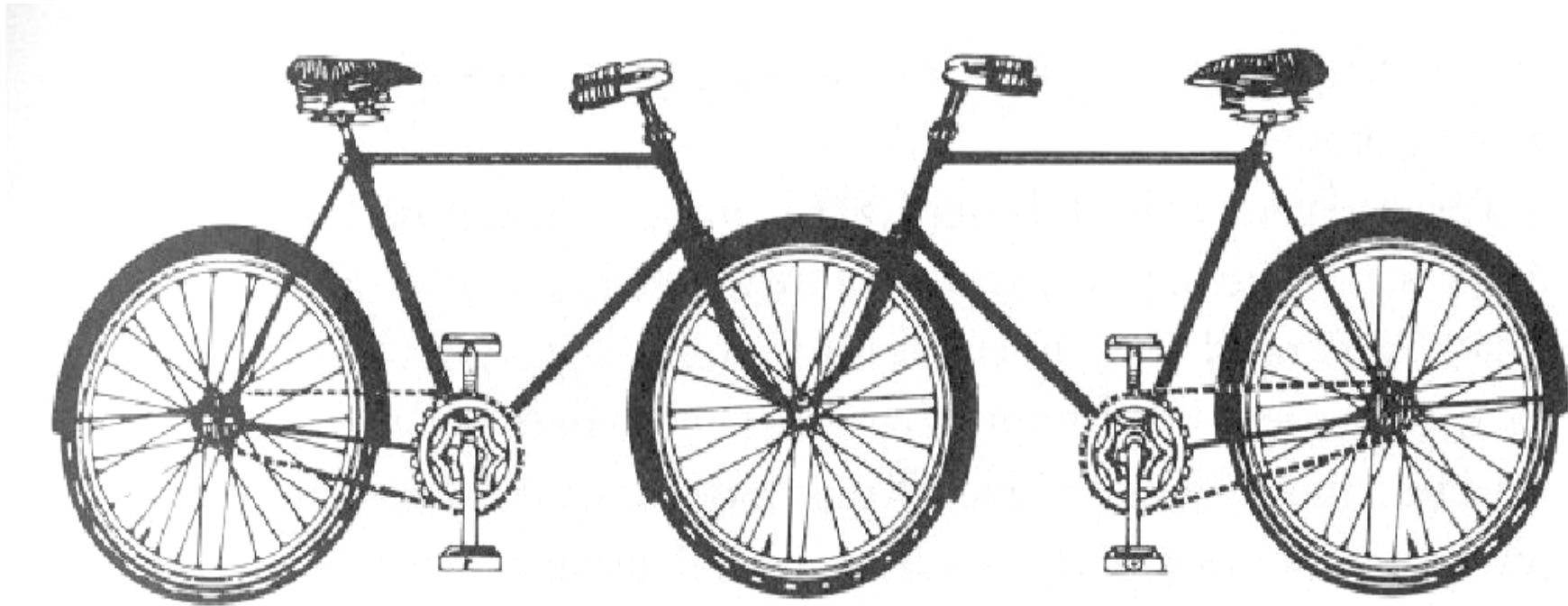
# Agenda

- The design relationship & process
  - Collaboration = surprise + tension + fear + relief
- Show & tell – how we did it
  - Generating new ideas
  - Embracing – not fighting with -- users
  - Iterative design – when we ‘thought’ we were finished . . .
- Unexpected benefits
- Lots of specific insights
- Your questions / comments

# Coffeepot for masochists *(Jacques Carelman)*



# Bicycle for fiancés *(Jacques Carelman)*



# The product

- Point of sale system for quick serve restaurants
  - Cash register (sales, payments)
  - Management planning + tracking
  - Complex data (discounts, product structure, etc.)
- Runs in touch screen environment
  - Need large objects, with space around them
- Fast fast pace

# Existing system -- Entering sandwich, drink, etc

Store# 11364 Cash Register Tr-Date 02-08-06(open)

T#: 46 Clk: 1 S/T: tko

Qty	Item	Amount	Disc
1	CHIPS	.90	1.75
1	DRK-21oz	.85	1.75
1	TUNA fr	5.49	1.75

STAMPS 0. TAX-OVR TX: .51 7.75

PREV. ORDER # 45 CURR. US\$  
STAMPS DUE TEND CHANGE  
0. 11.75 20.00 8.25

ITEM-CORR PRICE-OVR DISCOUNT  
QTY QTY-OVR PLU-LOOKUP TOTAL

DOUBLE MEAT

Level 1 Subs DELI-SAL MD-PRTY WRAP/1 Clerk Tasks

CC-TRIO	CC-TRIO	CRAB	CRAB	MEATBALL	MEATBALL	Small
CLUB	CLUB	TUNA	TUNA	STEAK	STEAK	Medium
BMT	BMT	SPICY	SPICY	MELT	MELT	SUBST. 2 COOKIES
TURK&HAM	TURK&HAM	TURKEY	TURKEY	TERYAKI CHK	TERYAKI CHK	BOTTLED WATER
VEGGIE	VEGGIE	HAM	HAM	GrChick	GrChick	BOTTLED WATER Sub
BLT	BLT	RST BEEF	RST BEEF	Chick Parm	Chick Parm	Bottled Juice
CHIC-SAL	CHIC SLD	TURBAC	TURBAC	GARDEN	GARDEN	Bottled Juice SUB
PEPPERONI	PEPPERONI	SALAMI	SALAMI	Chi Bac Ran	Chi Bac Ran	CHIPS
COOKIE	COOKIES -3	Make any 6" a Salad	Make 6inch on a CCwrap	Dinner for Two	\$2.79 Daily Spec	\$1.75 Meal Deal

Subway Card Unavailable

# Existing system -- Paying for it

Store# 11364 Cash Register Tr-Date 02-08-06(open)

T#: 46 Clk: 1 S/T: tko

**TAKE-OUT** **US\$** Due: \*\*\*\*\*7.75

EAT-IN TEND: \*\*\*\*\*.00

SCHOOL Amount: \*\*\*\*\*.00

Cash Change: \*\*\*\*\*.00

Credit

CredCard

SubCard

STAMPS 0. TAX-OVR TX: .51 **7.75**

PREV. ORDER # 45 CURR. US\$

STAMPS DUE TEND CHANGE

0. 11.75 20.00 **8.25**

ITEM-CORR PRICE-OVR DISCOUNT

QTY

QTY-OVR PLU-LOOKUP TOTAL

\$50 \$4

\$20 \$3 7 8 9

\$10 \$2 4 5 6

\$5 \$1 1 2 3

00 0 +

SAVE

PRE-REC SAVE-ORD PRINT-REC

NAME

PHONE

SC-6 INCH SC-FOOTLONG

DONE CANCEL

# The importance of interface design

- Interface design a process.
- Need for outside review
- OpenEdge® a solution, but not to this problem



# Our hopes

## ■ Carl

- Better management interface
- Responsible UI plan as system grows
- More intuitive and contemporary look + feel

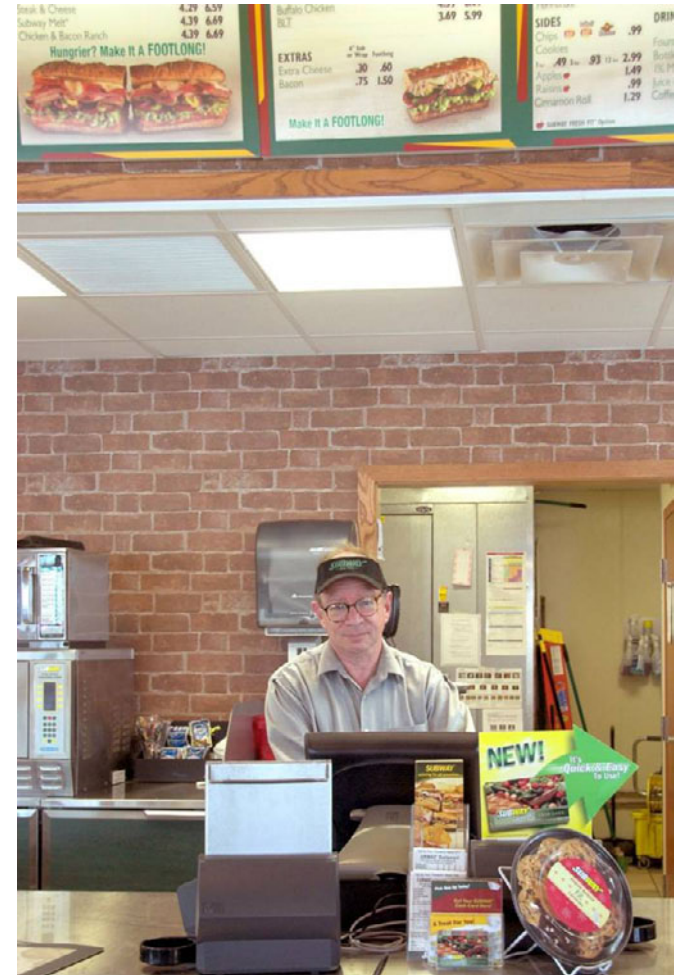
## ■ Arthur

- That Carl would let go of the 'ugly' features
- Much higher productivity + accuracy
- 'Showcase' solution for my portfolio

# Initial demonstration / training

- Carl's dual personality
  - Developer & entrepreneur (today)
  - Franchise owner / operator (yesterday)
- Carl ran system 'demo' in my office
- Arthur tried to imagine work environment

# Reality testing – on-site observation



# Reality testing – surprises for Arthur

- The current system worked
- High throughput + accuracy
- Users weren't complaining
- Users took responsibility for data!

# Reality testing – more surprises for Arthur

- System slowed down with ‘new’ user
- ‘Special’ requests a big problem
- User requests for new functionality

# New agenda – surprises for Carl

- Cash register could be major design focus
- Management UI not the biggest opportunity
- Examining UI led to rethink core business rules
- Change in look / feel led to changes in function

# The design process

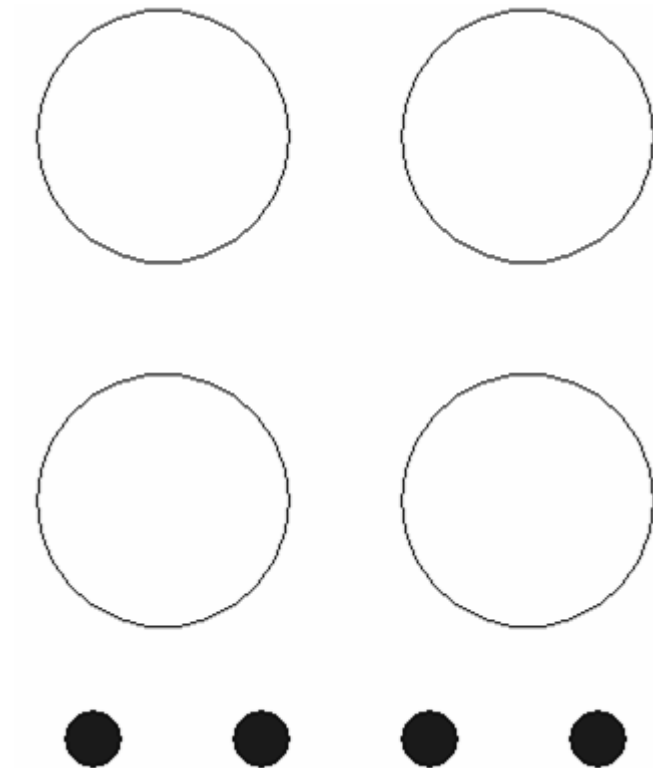
- Observation
  - “Being” cashier
  - Seeing user view of the world
- Reflection
  - Organizing critical tasks
  - Finding new paradigms
- Prototyping (again and again and again)
- User testing
- Iterate (prototype + test again ...)

# Design, by . . .

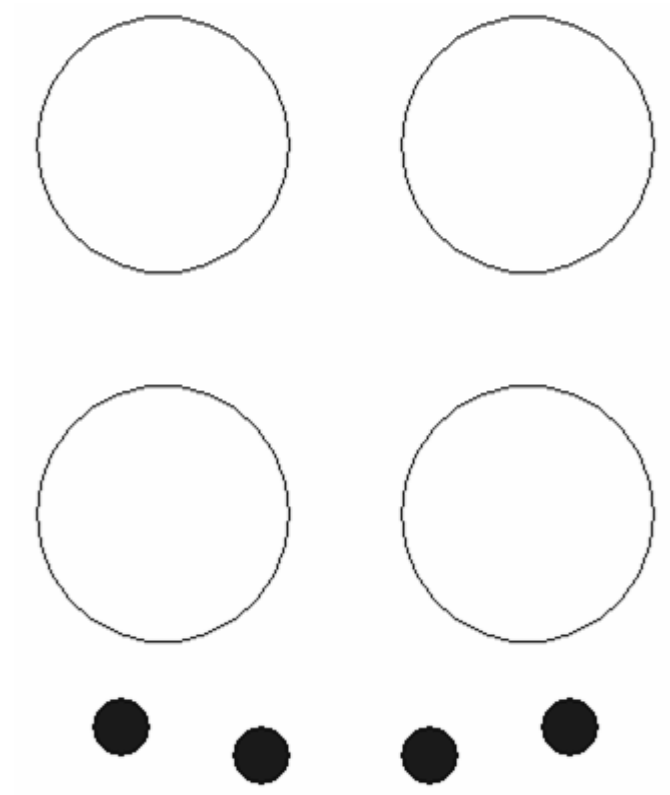
- Challenging assumptions
- Getting back to basics
- Generating ideas
- Respecting each other
- Maintaining patience



# Which knob controls lower left burner?



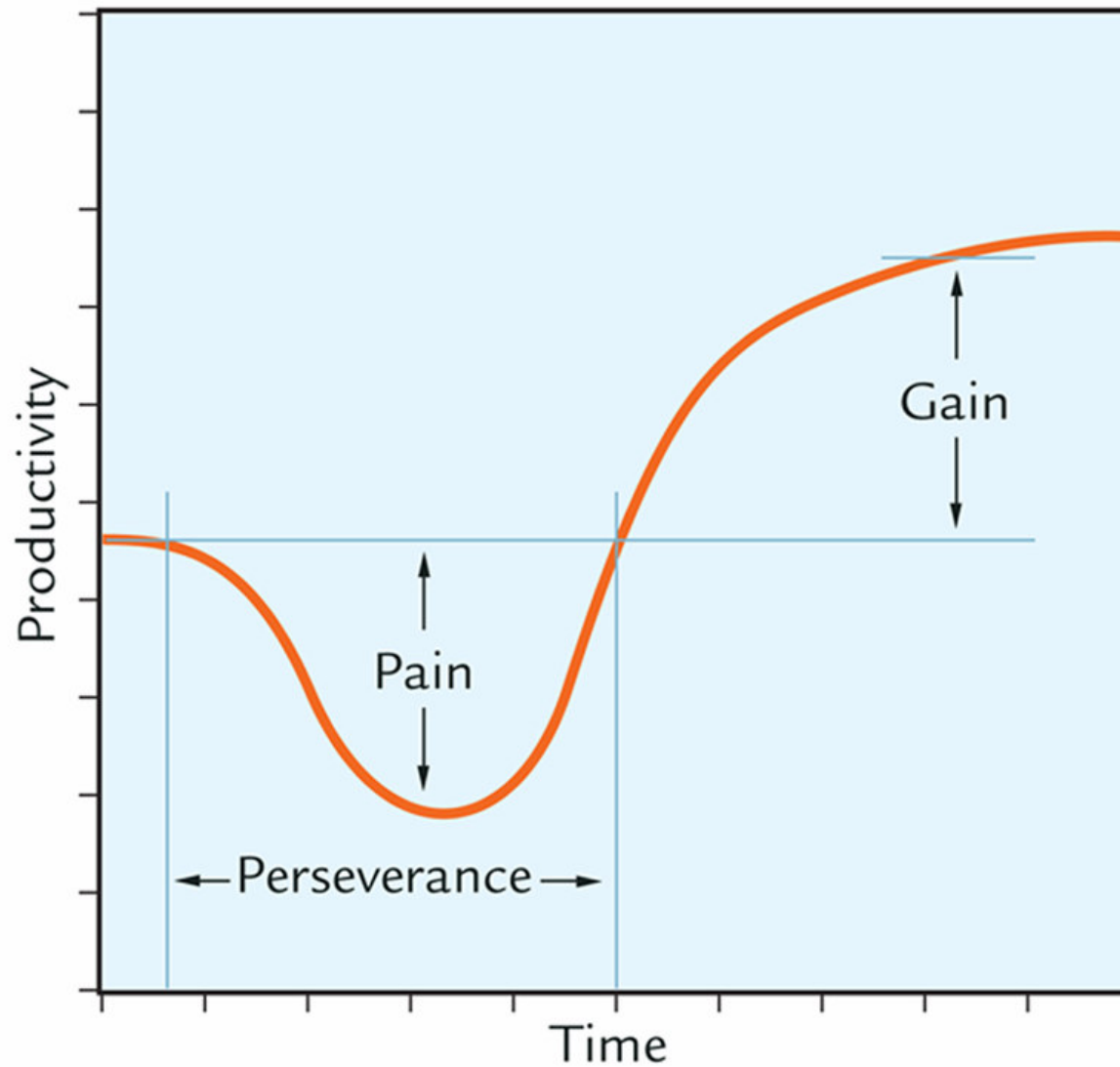
# Which knob controls lower left burner?



# The fear

- Change too stressful
- New UI would lead to errors
- Management would resist
- Store employees would complain

# Dispelling fear



# Clerk tasks screen -- existing

Store# 11364 Clerk Tasks Tr-Date 02-08-06(open)

PREV. ORDER # 46 CURR. US\$

STAMPS DUE TEND CHANGE

0. 7.75 7.75 .00

Post Close Adj.

DRILL	OPEN	ADJ	DETAIL	RESET				
O	Tr #	T	Clk	ST	Total	Tend	Chg	Tend
	46	s	Arthur	tko	7.75	7.75	.00	cash
	45	s	Arthur	tko	11.75	20.00	8.25	cash
	44	n	Arthur	tko	.00	.00	.00	
	43	s	Arthur	tko	13.98	20.00	6.02	cash
	42	s	Arthur	tko	11.96	11.96	.00	cash
	41	s	Arthur	tko	11.16	20.00	8.84	cash
	40	s	Arthur	tko	36.84	50.00	13.16	cash
	39	s	Arthur	tko	30.48	400.02	369.54	cash
	38	n	Arthur	tko	.00	.00	.00	
	37	s	Arthur	tko	8.63	10.00	1.37	cash

Enter your clerk id

7 8 9

4 5 6

1 2 3

0

Cash Register

Recall Order

Time Clock

Who's Punched-In?

Quit Clerk Tasks

Other Tasks

One-Minute Cash-In

Customer Look-Up

Sale Adjustment

Re-Print Receipt

No Sale

Sales Snapshot

Cash Drop Deposit

Adjust a cash register transaction

# Clerk tasks screen – proposed

**Clerk tasks**   **Register #1**   **Trans date 11/10/06 (open)**

Due 10.31 (on #11)   Paid 20.00   Change: **9.79**

Stat	Tran #	Type	Clerk	Sale	Amt paid	Change	Paid by
	1	n	Arthur	.00	.00	0.00	
	2	s	Arthur	6.89	7.37	0.48	cash
	3	s	Arthur	37.52	40.15	2.63	cash
	4	s	Arthur	7.28	10.00	2.72	cash
	5	s	Arthur	14.32	20.00	5.68	cash
	6	s	Arthur	2.79	5.00	2.21	cash
	7	s	Arthur	5.89	6.30	0.41	gif
	8	s	Arthur	5.29	10.00	4.71	cash
	9	s	Arthur	5.54	10.00	4.46	cash
	10	s	Arthur	17.87	20.00	2.13	cash
	11	s	Arthur	2.80	4.00	1.20	cash
	12	s	Arthur	.00	2.38	2.38	cash
	13	s	Arthur	5.49	20.00	14.51	cash
	14	s	Arthur	3.49	3.73	0.24	cash
	15	n	Arthur	.00	.00	0.00	
	16	n	Arthur	.00	.00	0.00	
	17	s	Arthur	1.40	1.50	0.10	cash
	18	s	Arthur	1.89	2.02	0.13	cash
	19	s	Arthur	1.39	1.49	0.10	cash
	20	s	Arthur	1.89	2.02	0.13	cash
	21	s	Arthur	7.24	10.00	2.76	cash

☒ All orders  
 ☐ Open orders  
 ☐ Adjusted orders

Enter your clerk ID:

7	8	9
4	5	6
1	2	3
0		Clear

**Cash Register**

Recall order	Reprint receipt
Cash drop	Quick balance
No sale	Sale adjustment
Sales snapshot	Customer lookup
Time clock	Who is in?
More tasks	Quit clerk's tasks

# Clerk tasks screen – proposed (‘more’ page)

**Clerk tasks**
**Register #1**
**Trans date 11/10/06 (open)**

Due 10.31 (on #11)
Paid 20.00
Change: **9.79**

Stat	Tran #	Type	Clerk	Sale	Amt paid	Change	Paid by
	1	n	Arthur	.00	.00	0.00	
	2	s	Arthur	6.89	7.37	0.48	csk
	3	s	Arthur	37.52	40.15	2.63	cre
	4	s	Arthur	7.28	10.00	2.72	csk
	5	s	Arthur	14.32	20.00	5.68	csk
	6	s	Arthur	2.79	5.00	2.21	csk
	7	s	Arthur	5.89	6.30	0.41	gif
	8	s	Arthur	5.29	10.00	4.71	csk
	9	s	Arthur	5.54	10.00	4.46	csk
	10	s	Arthur	17.87	20.00	2.13	csk
	11	s	Arthur	2.80	4.00	1.20	csk
	12	s	Arthur	.00	2.38	2.38	csk

Order detail
Drill down

☒ All orders
☐ Open orders
☐ Adjusted orders

Start new day	Poll other register(s)	End of day
Delivery	Usage adjustment	Paid out
Merchant reports	Connect to internet	Customer file
Daily control file		Other clerk tasks

Enter your clerk ID:

7	8	9
4	5	6
1	2	3
0		Clear

Cash Register

Recall order
Reprint receipt

Cash drop
Quick balance

No sale
Sale adjustment

Sales snapshot
Customer lookup

Time clock
Who is in?

Fewer tasks
Quit clerk's tasks



# Define discount – existing screen

**Change - 1 - \$1 Off Ft w/Med Drnk**

11364 Discount Code: 1 Description: \$1 Off Ft w/Med Drnk Short Desc.: \$1ftw/md

☐ active U.P.C.:  Whole Order Disc Type: none  
☒ inactive Control Sheet Coupon: \$1 off Whole Order Disc Value: .00  
☐ list  
Apply By ☒ regular Apply Sequence ☒ high ☐ low Expiry Date: 12/31/2099  
☐ Print Extra Receipt  
☒ Print Receipt?

Button Text Lines  
1: \$1 OFF FT Prompt for Comment: NO  
2: w/Med Dr Free Item Tax Basis: DEFAULT  
Other Button Settings Security Level: 0

CashReg Pricing is SELLPRICE:enter discount amounts/prices EXCLUDING TAX

Required Items (GENERAL)						
Item #	Disc Type	Req'd or Opt'l	Stamps Earned	Deduct Stamps	Override StmpMult	New Mult.
10	none	required	yes	no	no	.00
20	amount	required	yes	no	no	.00

CHOICES for Required Item (SPECIFIC)							
#	Pr	Cls	Dept.	PLU Subset	StdPrd Code	UsrDef Field	Discount Value
10						2	.00
20						3	.00

**Triggers** **OK** **Cancel**

**Delete** **New** **Change** **Help** **Delete** **New** **Change** **Help**



# Define discount – proposed screen

**Define discounts**

Find discount | Discount setup | Involving these PLUs | Button details | Add PLUs to order

Discount Code:  ☒ Active

Description:

Shorter:

U.P.C.:

Control sheet coupon:

Discount available: ☒ Every day  
☐ Sunday  
☐ Monday  
☐ Tuesday  
☐ Wednesday  
☐ Thursday  
☐ Friday  
☐ Saturday

Whole order discount: ☒ None  
☐ Amount off   
☐ New price   
☐ Percent off  %

Free items taxed by: ☒ Default method  
☐ Selling price  
☐ Full (list) price

Comments: ☒ Not allowed  
☐ Prompt (optional)  
☐ Required

At store: ☐ Discount is automatic  
☐ Print receipt  
☐ Print extra receipt

From: ☒ Opening time  
☐ :

Until: ☒ Closing time  
☐ :

☐ Date limits from:   
To:

Change  
Save  
Add  
Copy  
Delete  
Cancel  
Exit

# Define discount – detail of changes

11364 Discount Code: 1 Description:  Short Desc.:

☐ active U.P.C.:  Whole Order Disc Type:

☒ inactive Control Sheet Coupon:  Whole Order Disc Value:




☐ list Apply By: ☒ regular Apply Sequence: ☒ high ☐ low Expiry Date:

Button Text Lines Prompt for Comment:  ☐ Print Extra Receipt

1:  Free Item Tax Basis:  ☒ Print Receipt?

2:  Other Button Settings Security Level:

**CashReg Pricing is SELLPRICE:enter discount amounts/prices EXCLUDING TAX**

Triggers OK Cancel

Whole order discount: ☒ None

☐ Amount off

☐ New price

☐ Percent off  %

Free items taxed by: ☒ Default method

☐ Selling price

☐ Full (list) price

Comments: ☒ Not allowed

☐ Prompt (optional)

☐ Required

*UI does not need to follow data dictionary 'view-as'*

# Cash register screen -- issues

- Too many products to fit on one menu
  - Typical item can be: 12" *or* 6" *or* wrap *or* deli *or* salad *or* kids
  - Also drinks, discounts, special choices
  - Expect # choices to grow
  - Fast, accurate entry here is critical
- Display and receipt hard to read

# Cash register screen -- existing

Store# 11364 Cash Register Tr-Date 02-08-06(open)

T#: 46 Clk: 1 S/T: tko

Qty	Item	Amount	Disc
1	CHIPS	.90	1.75
1	DRK-21oz	.85	1.75
1	TUNA fr	5.49	1.75

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PREV. ORDER # 45 CURR. US\$  
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DOUBLE MEAT

Level 1 Subs DELI-SAL MD-PRTY WRAP/1 Clerk Tasks

CC-TRIO	CC-TRIO	CRAB	CRAB	MEATBALL	MEATBALL	Small
CLUB	CLUB	TUNA	TUNA	STEAK	STEAK	Medium
BMT	BMT	SPICY	SPICY	MELT	MELT	SUBST. 2 COOKIES
TURK&HAM	TURK&HAM	TURKEY	TURKEY	TERYAKI CHK	TERYAKI CHK	BOTTLED WATER
VEGGIE	VEGGIE	HAM	HAM	GrChick	GrChick	BOTTLED WATER Sub
BLT	BLT	RST BEEF	RST BEEF	Chick Parm	Chick Parm	Bottled Juice
CHIC-SAL	CHIC SLD	TURBAC	TURBAC	GARDEN	GARDEN	Bottled Juice SUB
PEPPERONI	PEPPERONI	SALAMI	SALAMI	Chi Bac Ran	Chi Bac Ran	CHIPS
COOKIE	COOKIES -3	Make any 6" a Salad	Make 6inch on a CCwrap	Dinner for Two	\$2.79 Daily Spec	\$1.75 Meal Deal

Subway Card Unavailable

## Cash register screen – design idea #1

Qty	Item	Cost	Ext	Notes
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	
		0.00	0.00	

Meatball

Turkey

Roast beef

BMT

Spicy

Vegetable

Tuna

Chickn sal

3 Meats

Seafood

12"

6"

Deli

Wrap

Salad

Drink sm

Drink lg

Drink bot

Water bot

Coffee

Just cup

Value meal

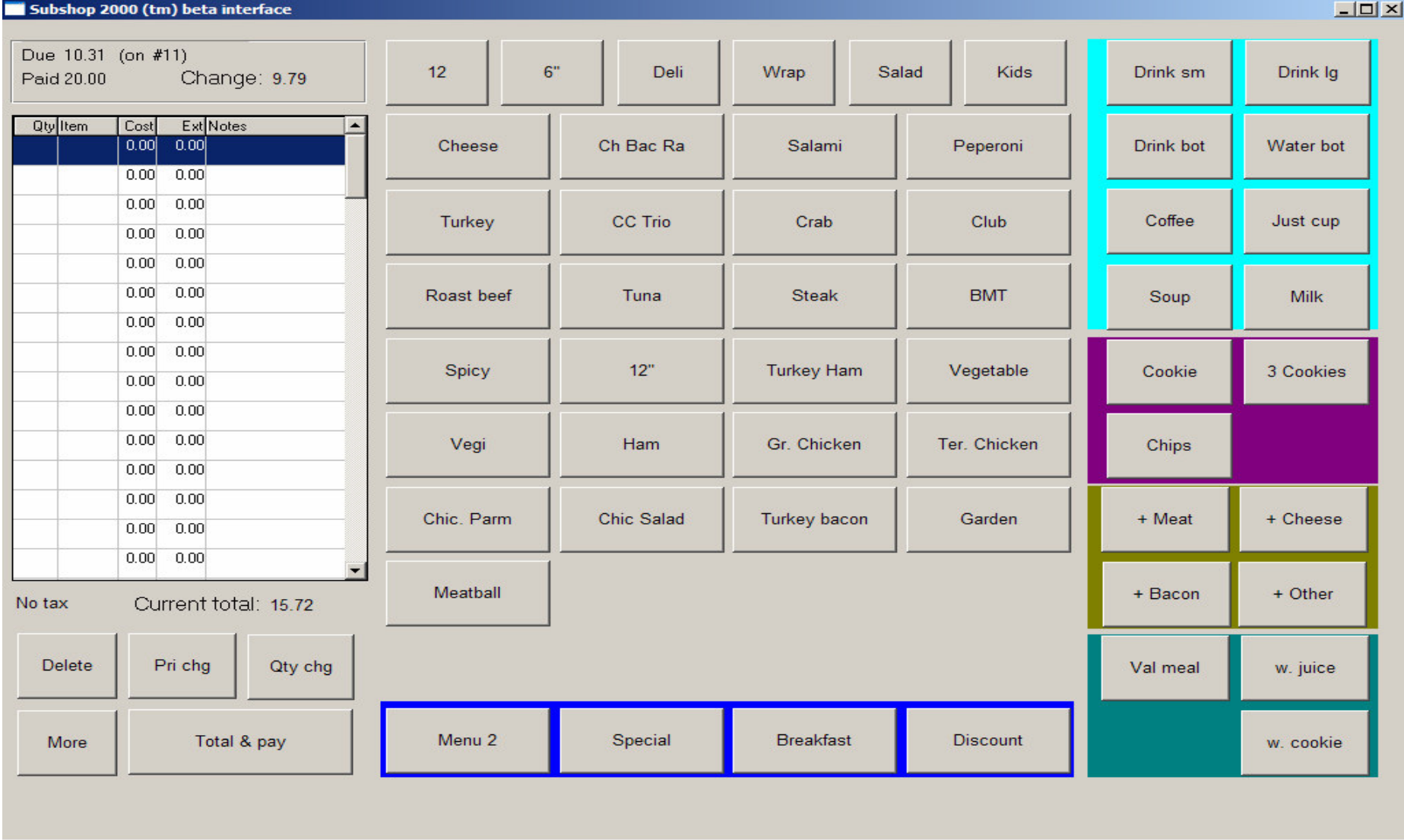
w. juice

w. cookie

+ Meat

+ Cheese

## Cash register screen – design idea #2

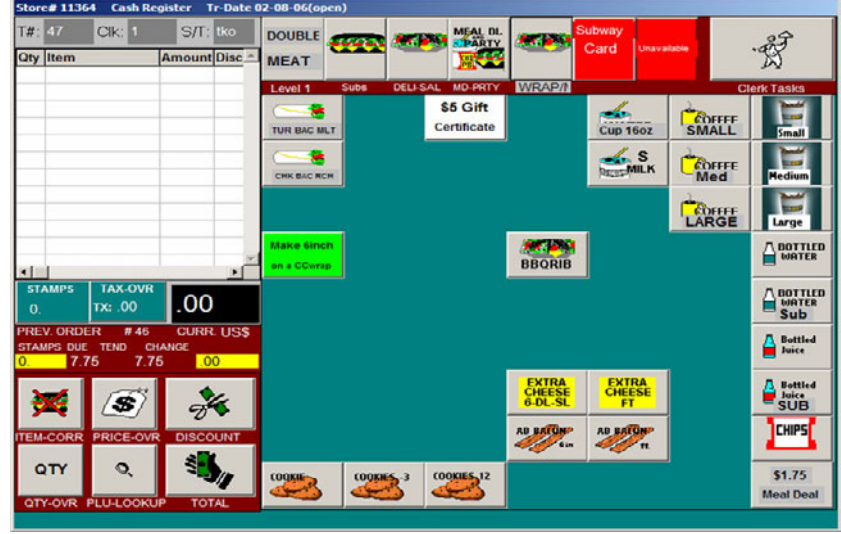
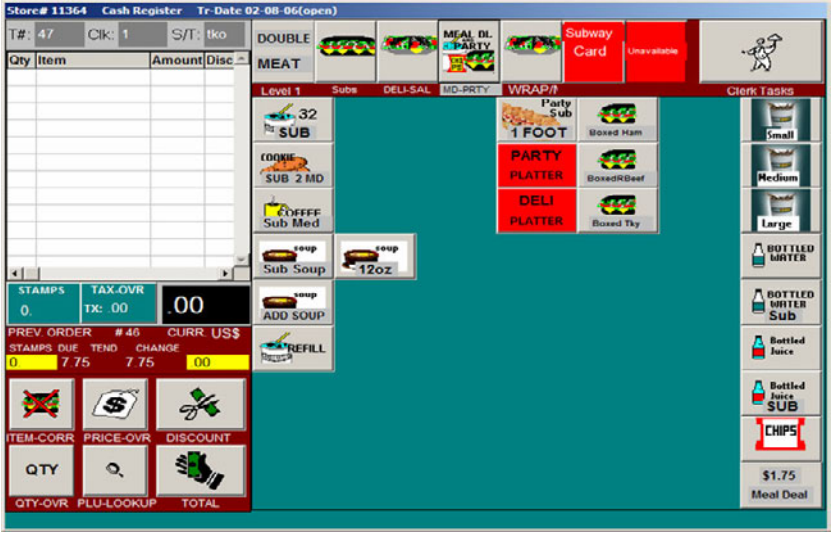
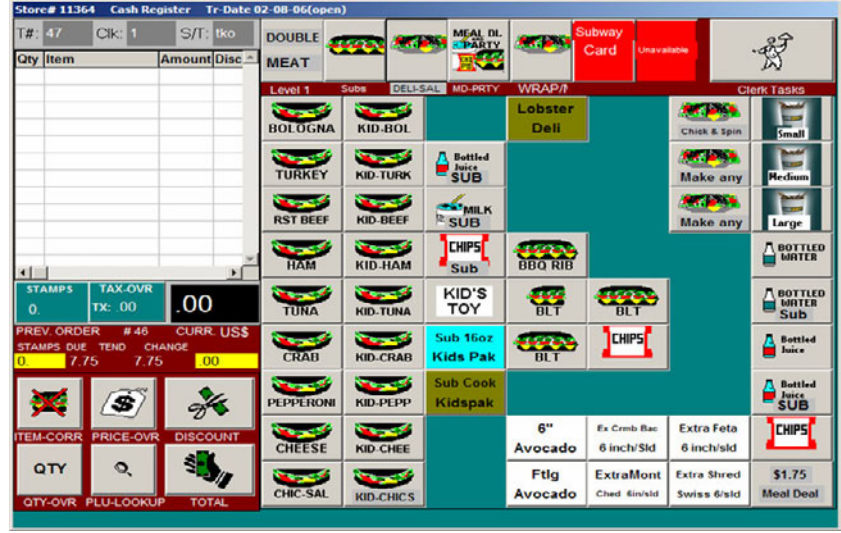
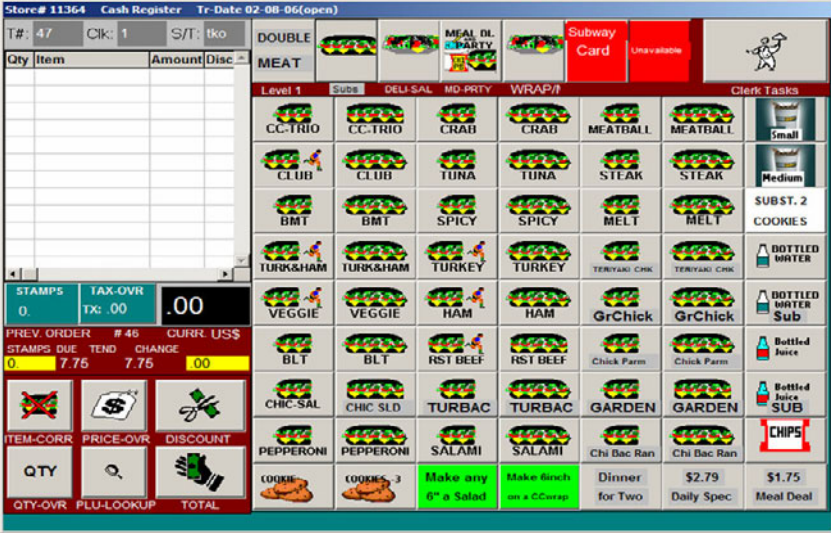


## Cash register screen – design idea #3

[illegible]



Cash register screen – four screens on one!





# Cash register screen – Letting go for change!

- No menu-item icons
- Store owners can't define icons
- Only single-line button labels
- All button labels the same size type
- Amount of text is limited
- May need two keystrokes / menu item
- But . . . fewer menu panel changes

# Cash register screen – Fear, & fear of change

- Multiple key strokes would slow users down
- Context keys would be confusing
- Clerks would ring up wrong items
- Too big a change for top management
- Losing icons = losing personality

## Cash register screen – design idea #4

[illegible]

## Cash register screen – design idea #5

Main menu			Register #1		Trans date 11/10/06 (open)		Arthur Fink		Trans# 1412									
Due 10.31 (on #11) Paid 20.00    Change: 9.79			12"		6"		Deli		Wrap		Salad		Kids				Return	
Qty	Item	Amount	Cheese		Ch Bac Ra		Salami		Peperoni		Drink S		Drink M		Drink L			
			Turkey		CC trio		Crab		Club		Coffee S		Coffee M		Coffee L			
			Roast beef		Tuna		Steak		BMT		Bottle		Water		Just cup			
			Spicy		Melt		Turkey ham		BLT		Soup		Milk					
			Veggie		Ham		Grill chicken		Ter. chicken		Cookie		3 Cookies		Chips			
			Chick parm		Chick salad		Turkey bacon		Garden									
			6" Ch Bac Ra		6" Grill chick.		6" Turkey		Meatball		+ Meat		+ Cheese		+ Bacon			
			6" BMT		12" BMT		12" Veggie								+ Other			
											Dly spec. meal deal							
			Special								Meal deal				Dly spec.			
			Menu 2		Breakfast		Discount				-> Juice		-> Cookie					
No tax   Current total: 15.72			Delete		Pri chg		Qty chg		More		Total & pay							

## Cash register screen – design idea #6

[illegible]



## Cash register screen – design idea #7

[illegible]

## Cash register screen – design idea #8

6*	249/220/48	Cheese	203/20/137	+ Meat	207/118/171	Total & pay	67/167/86
	255/242/57	Cheese	243/217/212				
				Cookie	176/123/37	More	158/197/77
12*	255/247/155	Drink S	121/194/218	Daily special	223/141/47	Delete	204/29/79
		Special	27/118/188			Pre chg	212/102/127
		6* Turkey	144/69/149				

## Cash register screen – design ideas #9, #10

Clerk tasks		Register # 1	Trans date 11/11/06 (open)						
Due 10.33 (on #11) Paid 20.00 Change 9.79		<b>6"</b>	<b>12"</b>	Deli	Wrap	Salad	Kids	Return	
Stat	Trans #	Type	Cheese	Ch Ba Ra	Salami	Pepperoni	Drink S	Drink M	Drink L
			Turkey	CC trio	Crab	Club	Coffee S	Coffee M	coffee L
			Roast beef	Tuna	Steak	BMT	Bottle	Water	Just cup
			Spicy	Melt	Turkey ham	BLT	Soup	Milk	
			Veggie	Ham	Grilled chick	Teriyaki chick	Cookie	3 cookies	Chips
			Chick parm	Chick salad	Turkey bacon	Garden			
			6"Ch Ba Ra	6" Grill chick	6" Turkey	Meatball	+ Meat	+ Cheese	+ Bacon
			6" BMT	12" BMT	12" Veggie				+ Other
							Daily special meal deal		
Delete	Prc chg	Qty chg	Special				Meal deal	Daily special	
More	Total & pay		Menu 2	Breakfast	Discount		-> Juice	-> Cookie	

Clerk tasks

Register # 1

Trans date 11/11/06 (open)

Due 10.21 (on #11)

Paid 20.20

Change 9.79

6"

12"

Deli

Wrap

Salad

Kids

Return

Stat

Trans #

Type

Cheese

Ch Ba Ra

Salami

Pepperoni

Drink S

Drink M

Drink L

Turkey

CC trio

Crab

Club

Coffee S

Coffee M

coffee L

Roast beef

Tuna

Steak

BMT

Bottle

Water

Just cup

Spicy

Mek

Turkey ham

BLT

Soup

Milk

Veggie

Ham

Grilled chick

Teriyaki chick

Cookie

3 cookies

Chips

Chick parm

Chick salad

Turkey bacon

Garden

6"Ch Ba Ra

6" Grill chick

6" Turkey

Meatball

+ Meat

+ Cheese

+ Bacon

6" BMT

12" BMT

12" Veggie

+ Other

Daily special meal deal

Delete

Prc chg

Qty chg

Special

Meal deal

Daily special

More

Total & pay

Menu 2

Breakfast

Discount

-> Juice

-> Cookie



# My inspiration – Don Norman



# Preliminary results

- Design philosophy –
  - Less is more
  - Show only what's needed.
- Prototype screens, with user acceptance.
- Standards, that should inform later design efforts.
- Working relationship
  - Informs future design efforts

# Usability is a lot more than User Interface (UI)

- UI Review uncovered gaps in functionality
- Perceived as UI problem
- Solution was different, simpler, data structure.
- *(Example: How to apply costs of a discount)*

# Why do it?

- Intangible vs tangible benefits
- This design process opened up path towards needed new functionality.
- A much more appealing and efficient look, feel, and efficient throughput.

# Your questions   Your comments

