

# Electronic Field Input System

Team 5

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# Background

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- ◉ Data is collected on paper forms submitted via mail
  - Potential for loss
  - Errors during the collection of the data
  - Errors during transcription to Excel
  - Long time to access the data



2/8/05

## Franklin D. Roosevelt Lake Creel Survey Form

Date (mm/dd/yy)

05/24/14

Survey Type

1

Creel Clerk Initials

J E M

Weekday

6

Start Work

0700

Finish Work

2100

Page 1 of 2

Section

1

Start Creel

1000

Finish Creel

2000

Total hours Creel

10.0

Comment #	Location	Party #	Party Size	Time Checked	No. of Anglers	Angler Type	Start Time	End Time	Complete Trip	Zipcode	Target Species 1	Target Species 2	Species Caught	Released / Kept	Total Length (mm)	Weight (g)	Species Origin	Mark	Fin Clip	Tag Color	Tag Number
4		3	1330	2	1	0630	1315	1	99206	3	0	3	1/15	EST. 380 mm	2	0	0	0			
					1	0630	1315	1	99206	3	0	3	1/15	EST. 385 mm	2	0	0	0			
					1	0630	1315	1	99206	3	0	3	1/10	EST. 380 mm	2	0	0	0			
5		3	1340	3	1	0700	1320	1	99206	3	0	3	1/8	EST. 370 mm	2	0	0	0			
					1	0700	1320	1	99206	3	0	3	1/8	EST. 380 mm	2	0	0	0			
					1	0700	1320	1	99206	3	0	3	1/4	EST. 385 mm	2	0	0	0			
													7	0			2	0	0	0	No. P.R. 24
5		2	1410	2	1	0700	1350	1	99141	3	0	3	0/7				0	0	0	0	
					1	0700	1350	1	99141	3	0	3	0/12				0	0	0	0	
		3	1520		1	0800	1510	1	99109	3	0	3	1/3	EST. 290	2	0	0	0	0		
					1	0800	1510	1	99109	3	0	3	1/3	EST. 385	2	0	0	0	0		
					1	0800	1510	1	99109	3	0	3	1/3	EST. 370	2	0	0	0	0		
6		2	1650	2	1	0700	1510	1	99141	3	0	3	1	395	505	2	0	0	0	0	
					1	0700	1510	1	99141	3	0	3	1	385	465	2	0	0	0	0	
													3	1	422	640	2	0	0	0	
													3	1	382	465	2	0	0	0	
													3	1	425	590	2	0	0	0	
													3	1	412	545	2	0	0	0	
5		2	1640	2	1	0800	1620	1	99206	3	0	3	1	395	500	2	0	0	0	0	
					1	0800	1620	1	99206	3	0	3	1	390	490	2	0	0	0	0	
													3	1	380	435	2	0	0	0	
													3	1	390	485	2	0	0	0	

3 1/10 EST. 387mm 2 0 0 0

Notes:

estimate 1 (122)

# Requirements

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- Electronic Input System
  - Creel (Top priority)
  - Raw Fish
  - FWIN
- Easily updatable/maintainable
  - Study needs change over time
- Fully functional with Team 4's database
- Solution can't depend on an Internet connection

# End User

## ◉ Creel Clerk

- Two Types
  - Access
  - Bus Route
- Trained how to do a Creel Survey
- Varying computer skills



# Operating Environment

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- ◉ Getac Tablet

- Windows 7 Professional (64 bit)

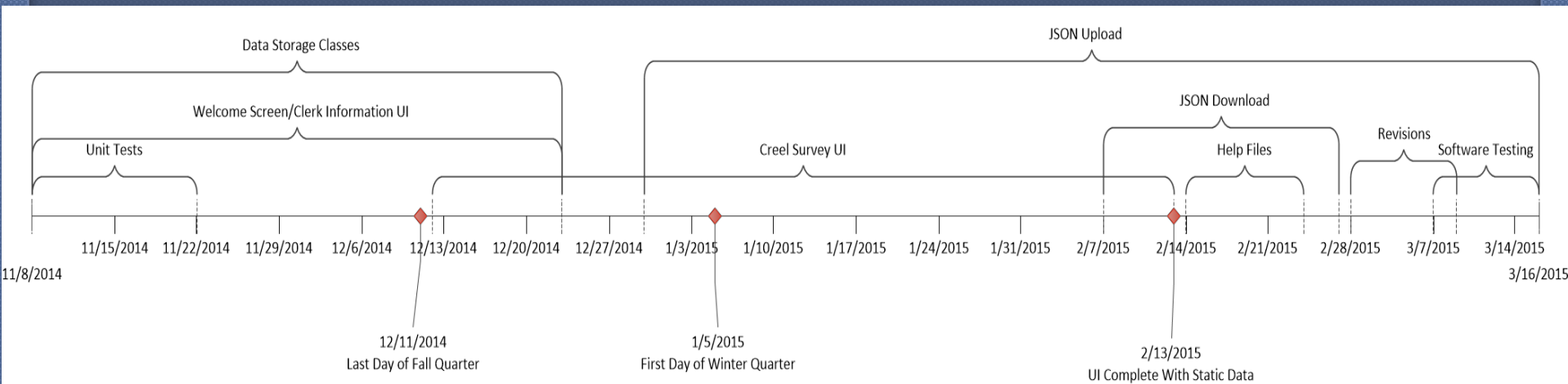


# Our Basic Idea

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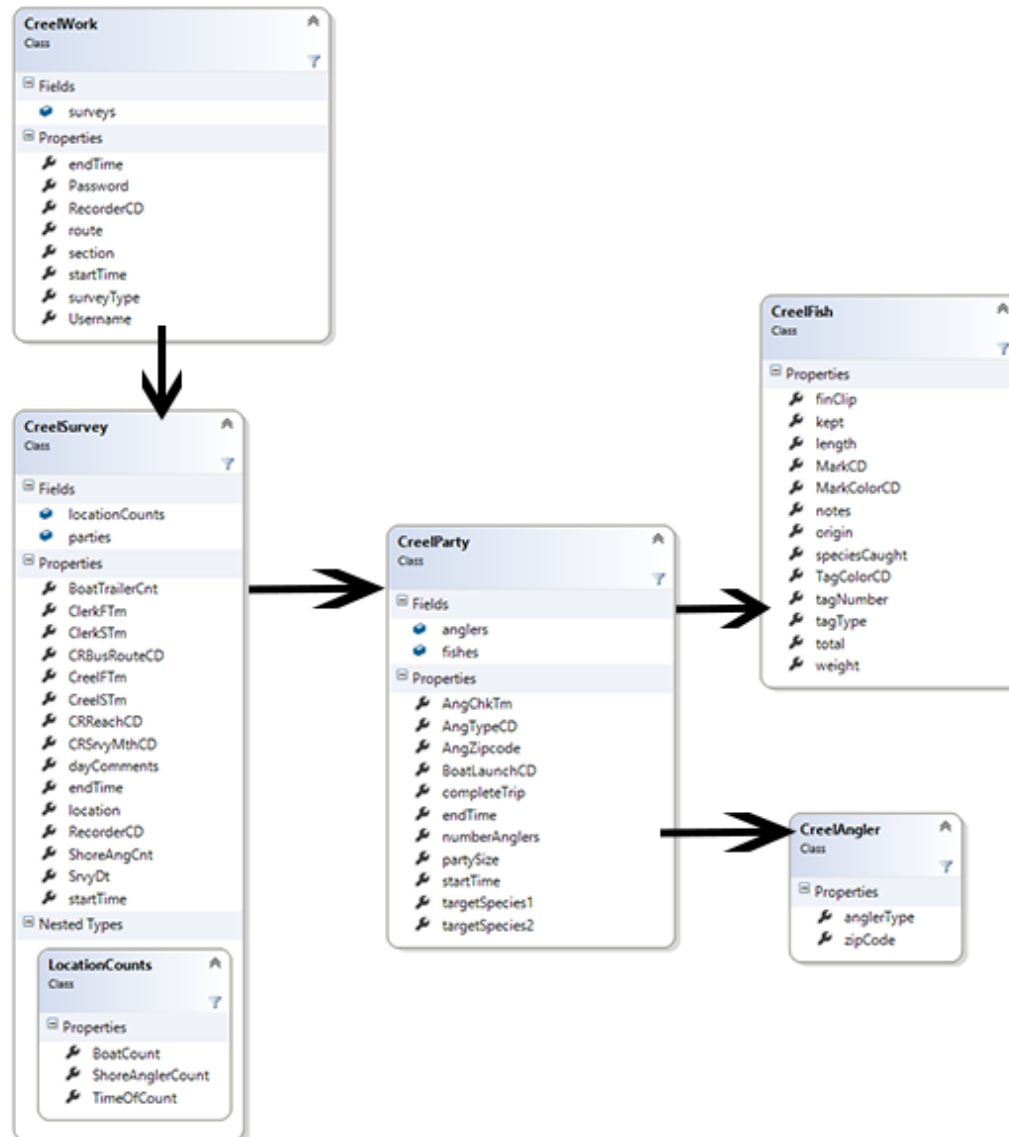
- ⦿ C# Winforms
- ⦿ Local data storage
  - Codes
  - Data collected
- ⦿ Some means of communicating with the database

# Development Process



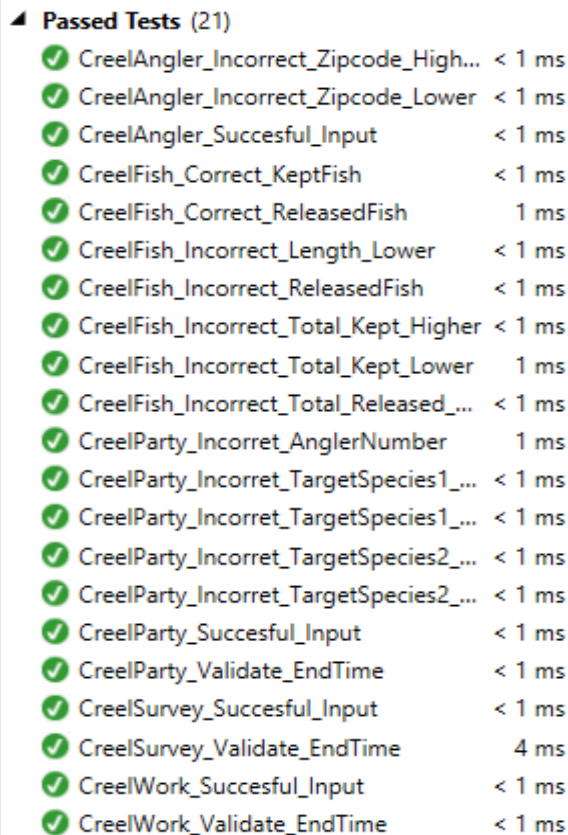


# Data Storage Classes



# Unit Testing

- Used throughout development to ensure proper functionality of data storage objects



A screenshot of a test runner interface showing a list of 21 passed tests. Each test is preceded by a green checkmark icon. The tests are listed in a single column, and their execution times are shown to the right of each test name. The tests are grouped under a header 'Passed Tests (21)'.

Passed Tests (21)	
✓ CreelAngler_Incorrect_Zipcode_High...	< 1 ms
✓ CreelAngler_Incorrect_Zipcode_Lower	< 1 ms
✓ CreelAngler_Succesful_Input	< 1 ms
✓ CreelFish_Correct_KeptFish	< 1 ms
✓ CreelFish_Correct_ReleasedFish	1 ms
✓ CreelFish_Incorrect_Length_Lower	< 1 ms
✓ CreelFish_Incorrect_ReleasedFish	< 1 ms
✓ CreelFish_Incorrect_Total_Kept_Higher	< 1 ms
✓ CreelFish_Incorrect_Total_Kept_Lower	1 ms
✓ CreelFish_Incorrect_Total_Released_...	< 1 ms
✓ CreelParty_Incorret_AnglerNumber	1 ms
✓ CreelParty_Incorret_TargetSpecies1_...	< 1 ms
✓ CreelParty_Incorret_TargetSpecies1_...	< 1 ms
✓ CreelParty_Incorret_TargetSpecies2_...	< 1 ms
✓ CreelParty_Incorret_TargetSpecies2_...	< 1 ms
✓ CreelParty_Succesful_Input	< 1 ms
✓ CreelParty_Validate_EndTime	< 1 ms
✓ CreelSurvey_Succesful_Input	< 1 ms
✓ CreelSurvey_Validate_EndTime	4 ms
✓ CreelWork_Succesful_Input	< 1 ms
✓ CreelWork_Validate_EndTime	< 1 ms

# User Interface Mocks

- Presented to the client for approval before beginning work
- Referred to throughout development

**Tuesday 10/14/2014**

Initials	Survey Type	Section	Route	Work Start	Work End
TAF	Bus	Upper	94	8:06	End

Location	Start	End	Parties	Fish
Bus Route 94	8:05	8:55	4	37
Bus Route 95	9:37	10:19	7	31
Bus Route 96	10:53	11:45	2	6
Bus Route 97	12:13	13:08	10	53

Start New Location

**5th Location**

Location Start Time	Location	Time At Location
8:06	30 - Snag Cove	0:50

**Party #3**

Party Size	No. of Anglers	Start Time	End Time	Complete Trip	Target Species 1	Target Species 2
2	2 +	6:30	13:06	Y N	Rainbow Trout	Kokanee Salmon

Species Caught	Kept / Released	Total	Length	Weight	Mark / Tag	Fin Clip	Tag Type	Tag Number	Notes
Rainbow Trout	K R	1	380	712	Y N	Y N	Floy	ABCDEFGHIJ 1234567890	
Kokanee Salmon	K R	1	97	216	Y N				
Rainbow Trout	K R	7							
Kokanee Salmon	K R								

+ Fish      New Party      End Location

# User Interface

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- ◉ Single form

- Table layout panels swapped at runtime

- ◉ Custom controls

- Ease of use
  - Make up for what Winforms was lacking

- ◉ Custom keypads

- Ease of use
  - Not as much error checking
  - Aesthetics

# JSON Download

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- ◉ We download the look up table from db team using the upload/update button
- ◉ Data comes in as json which is then deserialized using newtonsoft json package
- ◉ Placed in objects which are then used for dynamic data
  - Changes on db side will be reflected on our side(For example adding a new fish species etc...)
- ◉ Saved on local tablet file system in case Internet connection is not available

# JSON Upload

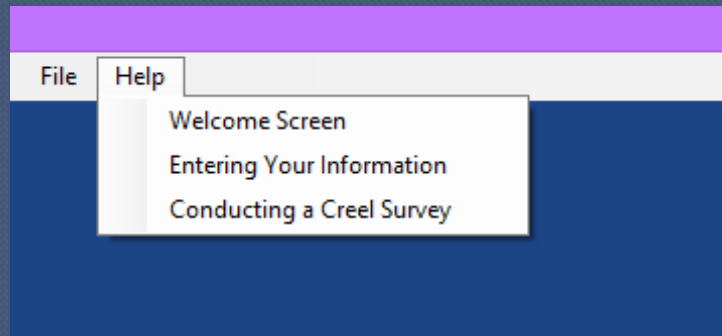
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- ◉ Data is sent to the db via json
- ◉ Data is serialized using the newtonsoft package
- ◉ Data is also stored on the tablets local file system in case Internet access is not available at time of upload.
- ◉ On successful upload to the db json is moved from incomplete folder to complete where it is stored permanently on tablet

# Help Files

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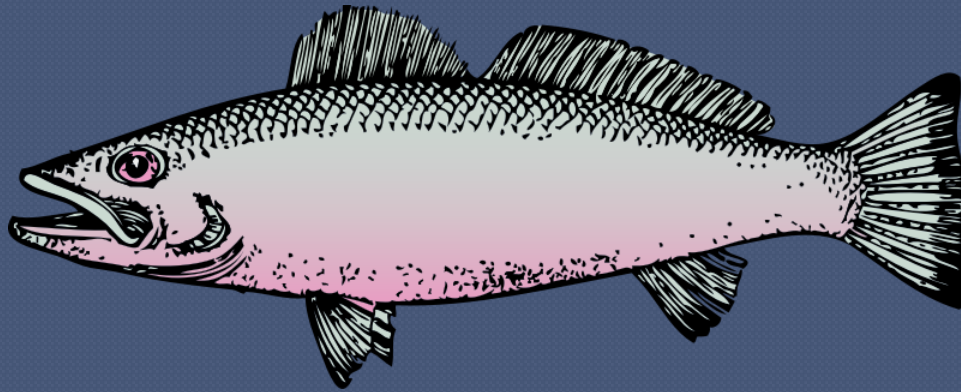
- ◉ Built into the application via a menu bar
- ◉ Pdf version for in office use



# Simulated Field Tests

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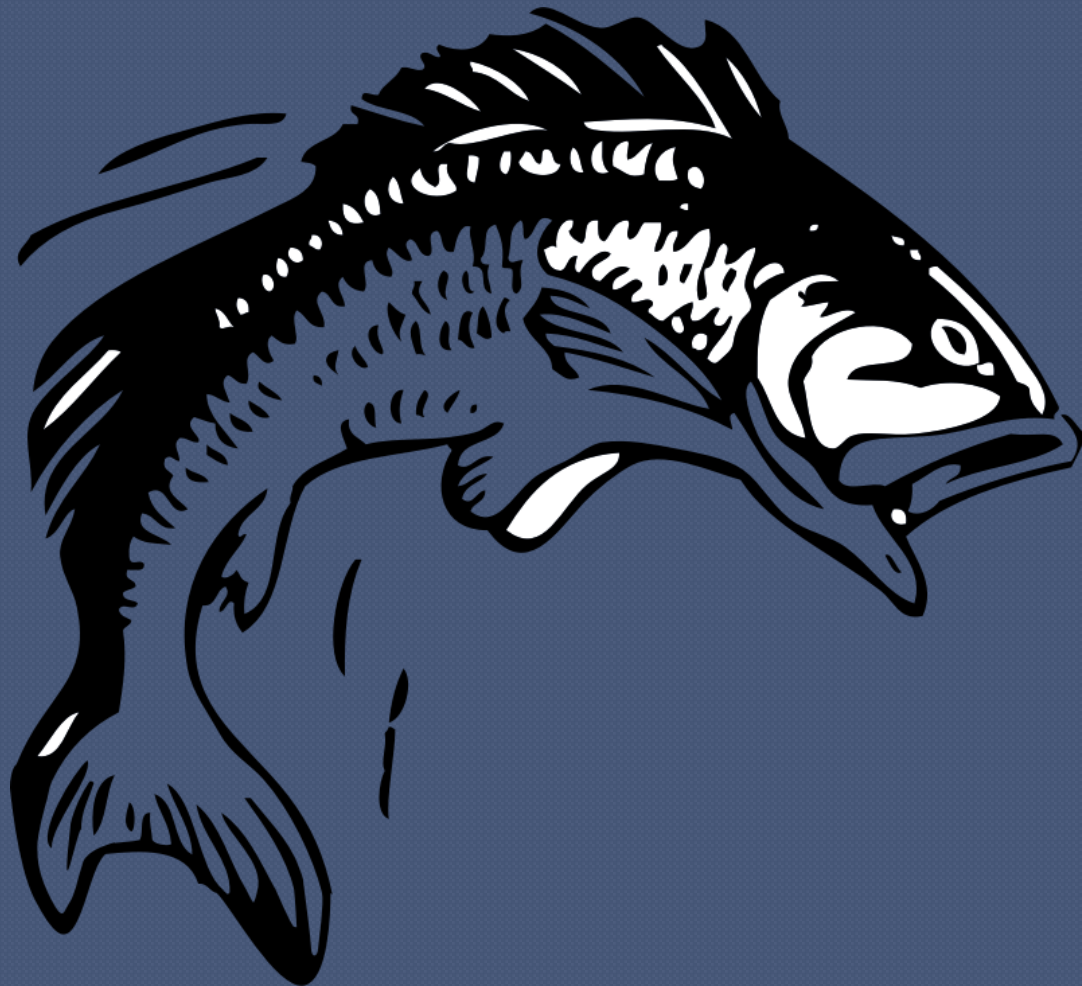
- ◉ Testing for
  - Overall functionality
  - Performance with large amounts of data





# Demonstration

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# What We Learned

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## ◉ Stacy

- C#
- Implementing the Software Development Lifecycle

## ◉ Thomas

- Dealing with feature creep

## ◉ Ralph

- C#: Creating User Interface controls
- How to work with another team
- Read documentation thoroughly

# Questions

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