



Technical Debt in FinTech

CHARTING THE OPTIMAL JOURNEY

What is Tech Debt?

- Cost of additional work caused by choosing a quicker path rather than the most effective solution
- Quicker code delivery can help your team meet deadlines
- Like financial debt, tech debt can be use in both good and bad ways



What is the Cost?

- Can end up supporting multiple custom code bases (duplication)
- Fragile and inconsistent releases
- Mental (cognitive) overload
- Slows down development and creates more bugs
- Possible security issues



What is the Cost?

- Can end up supporting multiple

CU

- Fr

- M

- SI

CR

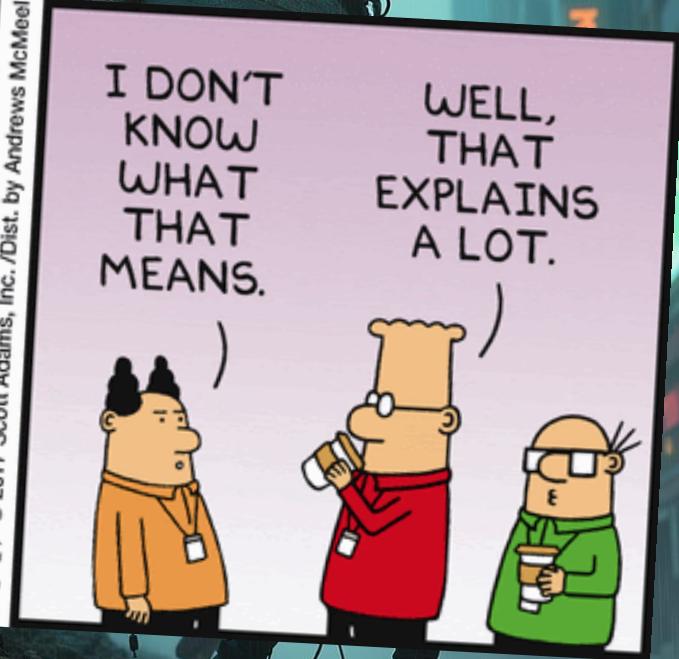
- Possible security issues



@ScottAdamsSays
Dilbert.com



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*Types of Tech Debt

	Deliberate	Inadvertent
Reckless	We don't have time...	We don't know how...
Prudent	We'll deal with it later...	We shouldn't have done that...

Graphic is from Asana article:
<https://asana.com/resources/technical-debt>

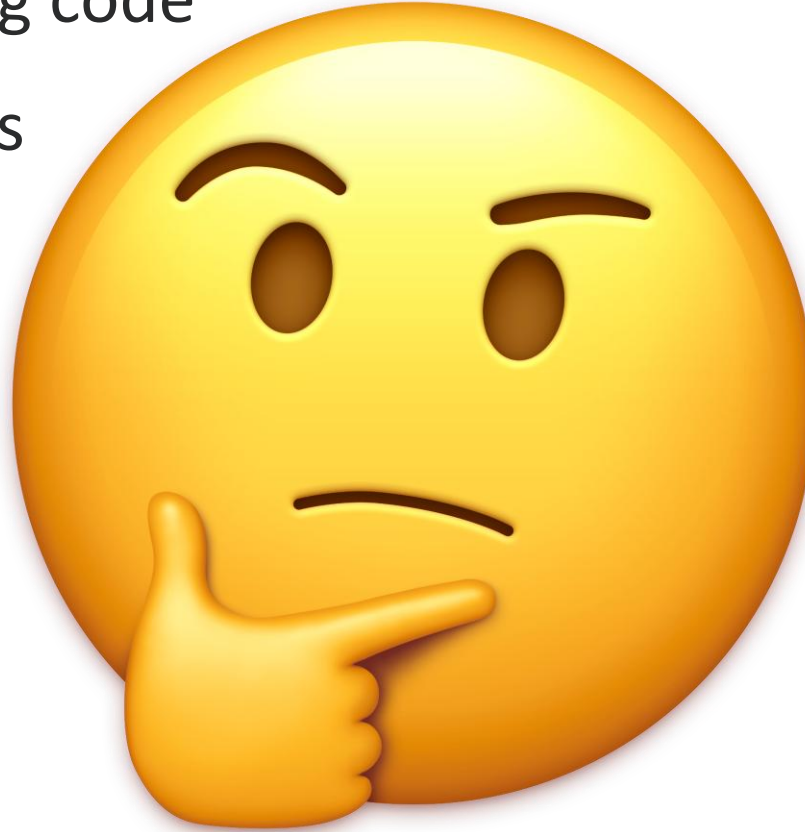
Our Legacy App

- 15+ years old (build using ASP.NET Web Forms)
- Customers are unhappy with support and feature release
- Devs unhappy with lack of clarity and process
- Management unhappy with difficult feature development (takes too long/poor results)

The screenshot displays a web application interface for a 'Setup Review'. At the top, a dark navigation bar contains links for 'Dashboard', 'Clients', 'Client Tasks', 'Adviser Tasks', and 'Settings'. Below this, a light gray header area features a 'Setup Review' title with a play icon and a 'Client Name: Price, Beverly' label. A progress bar below the header shows three steps: 'Introduction', 'Confirm Details' (the active step, highlighted with a dark arrow), and 'Create Review'. The main content area has a sub-navigation bar with links for 'Contact Details >', 'Portfolio', 'Investment Objectives', and 'Goal Summary'. A large gray box with the heading 'Please Confirm Contact Details' contains the instruction: 'Please review the client's contact details below to ensure that we have these correct.' Below this, a 'Contact Details' section is shown, which is a form for a 'Client'. The form includes a 'Physical Address' section with an 'Address Lookup' field containing '33a Canning Street, East Gore, Gore' and a location pin icon. Below this are input fields for 'No:' (containing '33a'), 'Street Name:' (containing 'Canning Street'), and 'Suburb:' (containing 'East Gore').


What to Modernize (and How)

- Revisiting and fixing code
- Avoiding quick fixes
- Prioritizing quality over speed
- Utilizing best practices
- Better documentation
- Better testing
- Avoiding tightly coupled components
- Aligning (or set) standards



OMNIMax Fresh Eyes report

- Fresh perspective from a new employee - providing feedback on a company's processes
- Highlighting areas for improvement
- Constructive criticism from a new perspective to identify potential areas for change within an organization



The image shows the cover of a report titled "OMNIMax Fresh Eyes Report". At the top, a blue arrow points right with the date "11/16/2020". The title "OMNIMax Fresh Eyes Report" is prominently displayed in blue. Below the title, the author's name "Jason Butler" and his affiliation "OMNIMAX ADVICE SOFTWARE" are listed.

Contents	
Introduction	2
Key Tech Goal #1 – Quick Customizations	2
Key Tech Goal #2 – Powerful API	3
Key Tech Goal #3 – Security	3
Infrastructure	4
Azure Hosting	4
Network Security in Azure	4
Database	4
Other Azure offerings	4
Backend	5
Frontend	5
Testing	6
Development Team	7
Development Process	7

Start with "Easy" and "Obvious"



- Clean-up code base and repos
- Implement code branching strategy
- Implement (basic) release strategy
- Simplify App where possible
- POC on new tech
- Define key terms (DOR, DOD)

*Start with "Easy"



APRIL 6, 2000 by JOEL SPOLSKY

Things You Should Never Do, Part I

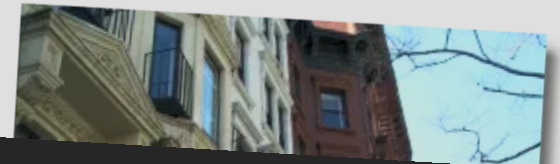
TOP 10, CEO, NEWS

Netscape 6.0 is finally going into its first public beta. There never was a version 5.0. The last major release, version 4.0, was released almost three years ago. Three years is an *awfully* long time in the Internet world. During this time, Netscape sat by, helplessly, as their market share plummeted.

It's a bit smarmy of me to criticize them for waiting so long between releases. They didn't do it *on purpose*, now, did they?

Well, yes. They did. They did it by **making the single worst strategic mistake** that any software company can make:

They decided to rewrite the code from scratch.



Architecture and Migrations

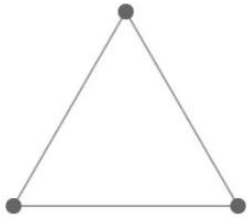
- Physical computer -> IaaS (Azure)
- IaaS -> PaaS (Azure)
- Infrastructure as Code (IaC)
- Monolith -> Scalable architecture
 - IAPI
 - EAPI
 - React front-end
- Use 3rd Party tools
- Deployment Dashboard



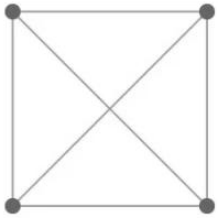
Deployment Dashboard

OMNIMaxApp	Build develop 20250218.1 up to date		Build master 20250205.1 up to date	
	Deploy Dev  Dev_20250218.1 [20250218.1] up to date	Deploy Test  Test_20250219.1 [20250218.1] up to date	Deploy Staging  Staging_20250205.1 [20250205.1] up to date	Deploy Prod  Prod_20250207.1 up to date
OMNIMaxServices	Deploy Dev  Dev_20250218.1 [20250218.1] up to date	Deploy Test  Test_20250219.1 [20250218.1] up to date	Deploy Staging  Staging_20250205.1 [20250205.1] up to date	Deploy Prod  Prod_20250207.1 up to date
OMNIMaxInternalAPI	Build develop 20250219.1 up to date		Build main 20250205.1 up to date	
	Deploy Dev  Dev_20250219.1 [20250219.1] up to date	Deploy Test  Test_20250219.1 [20250218.2] out of date by 2 commits	Deploy Staging  Staging_20250205.1 [20250205.1] up to date	Deploy Prod  Prod_20250207.1 up to date
	Integration Test - Dev Dev_20250219.1 up to date	Integration Test - Test Test_20250219.2 up to date	Integration Test - Staging Staging_20250205.1 up to date	
OMNIMaxAPI	Build develop 20241030.2 up to date		Build main 20241107.1 up to date	
	Deploy Dev  Dev_20250203.1 [20241030.2] up to date	Deploy Test  Test_20250219.1 [20241030.2] up to date	Deploy Staging  Staging_20241107.1 [20241107.1] up to date	Deploy Prod  Prod_20241108.1 up to date
		Integration Test - Test Test_20250219.1	Integration Test - Staging Staging_20250214.1	Integration Test - Prod_20250211.1

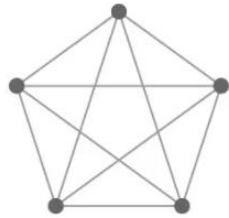
Culture!



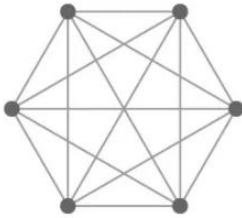
3 people, 3 lines



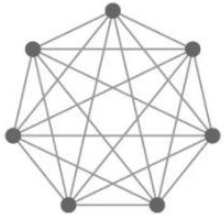
4 people, 6 lines



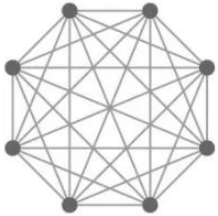
5 people, 10 lines



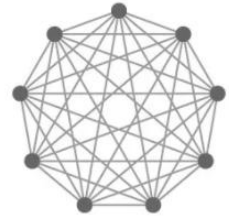
6 people, 15 lines



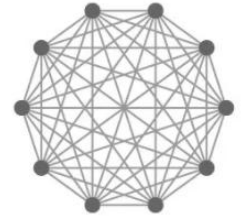
7 people, 21 lines



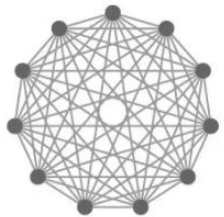
8 people, 28 lines



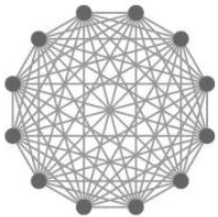
9 people, 36 lines



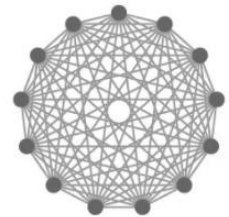
10 people, 45 lines



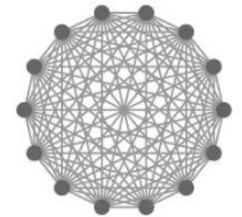
11 people, 55 lines



12 people, 66 lines



13 people, 78 lines



14 people, 91 lines

- Develop a Growth Mindset
- Inspect and Adapt
- Decriminalize mistakes
- Fix the system
- Commit to high quality
- Develop business focus
- Tighten feedback loops

Time for New Products

- Have key pieces in place
- Decided to keep DB mostly as is (this supports Legacy Apps)
- OMNIMax 2.0 -> "O2"
- Start with building up of a library of reusable Components (Goals, Contacts, Signatures, etc.)



Migrate Upgrade Investment app



- How to start a big project the right way?
- We used JAD meetings (with MoSCoW)
- Work out as many issues as possible in design first
- Spec should be 10% to 20% of project budget
- Need a Product Owner who can make the final call

Investment Adviser Tool



Step 1: Issue fact find

Step 2: Client completes fact find including a risk profiling assessment

Step 3: Evaluate fact find

Step 4: Use the Investment Projection tool to demonstrate the value of your advice

Step 5: Make your recommendation from your preferred providers

Step 6: Generate Statement of Advice

Step 7: Client reviews and agrees to advice online or in person




Step 8: Review and execute advice

iINVEST DEMO

-
- Client Details
- Taylor's KiwiSaver
- Existing Assets
- Goals
- Retirement
- Big Vacation
- New Car
- + Add goal
- Taylor's Risk Profile
- Summary
- Projection
- Recommendations

Goals

Add goal

Goal Name	Description	
 Retirement Retirement	\$1,200 per week from 2055 until 2074	Delete Edit
 Big Vacation Savings Goal	\$12,000 every 3 years from 2030 until 2055	Delete Edit
 New Car Savings Goal	\$40,000 every 5 years from 2030 until 2060	Delete Edit

<< Previous

Next >>

iINVEST DEMO

Fred Smith

Staging

Exit

Client Details

Taylor's KiwiSaver

Existing Assets

Goals

Taylor's Risk Profile

Summary

Projection

Recommendations

Advice Summary

Report

Implement

Taylor's Risk Profile

Would you like to set Taylor's risk profile via a Questionnaire, or set this manually? *

Set via Questionnaire

Set Manually

Taylor has completed the Default questionnaire on 21st February 2025. Would you like to use this or complete a new one? *

Use Latest Questionnaire

Complete New Questionnaire

1. What is your investment timeframe?

In the next 12 months

In the next 1 - 2 years

In the next 2 - 5 years

In the next 5 - 10 years

In the next 10 - 15 years

In more than 15 years

2. The balance of your investment will fluctuate. Which statement do you most align with?

I want to minimise my risks, and I realise this will mean lower returns.

I am willing to take a relatively low amount of risk to potentially achieve a low to medium level of returns.

I am willing to balance my risk with returns to achieve a medium level of returns.

Build Version: 20250220.9



Client Details

Taylor's KiwiSaver

Existing Assets

Goals

Taylor's Risk Profile

Summary

Projection

Recommendations

Advice Summary

Report

Implement

Summary

First name	Taylor
Last name	Swift
Date of birth	13/12/1989
Mobile number	555-123-1234
Email address	taytay@taylorswift.com

Household Contacts

Name	Relationship	Date of birth
Andrea Swift	Mother	10/01/1958

KiwiSaver details

iINVEST DEMO

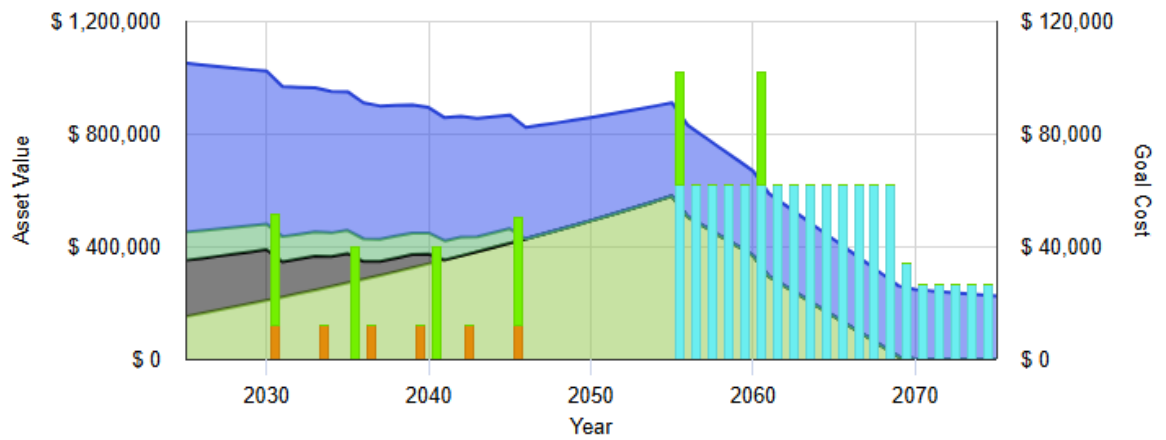
Staging
Fred Smith
Exit

- Client Details
- Taylor's KiwiSaver
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- Summary
- Projection
- Recommendations
- Advice Summary
- Report
- Implement

Projection

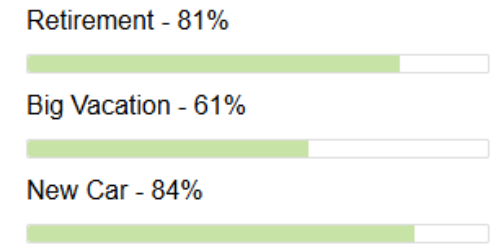
Assets over time

☒ Show Goals ☒ Show in today's dollars Client Lifespan



- Taylor's KiwiSaver Net Value
- Radio Station Net Value
- Cash in Hand Net Value
- Investment Property Net Value
- Retirement Funded
- Big Vacation Funded
- New Car Funded

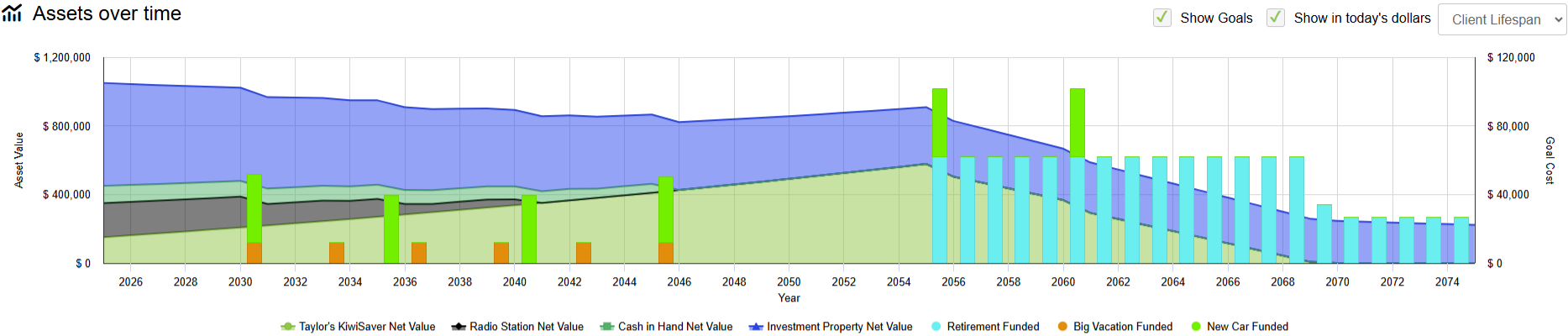
Goal Funding



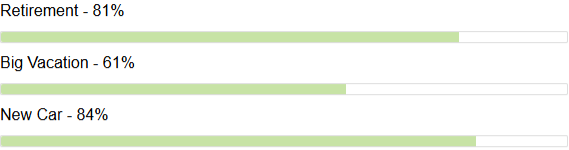
Goals

Retirement Big Vacation New Car + Add new goal

Assets over time



Goal Funding



Goals

Retirement Big Vacation New Car + Add new goal

Goal details: Retirement ☒ Include in projection

Taylor's retirement age *

Taylor's life expectancy *

65

85

The following questions use research from Massey University to help you determine how much income you might require at retirement. ?

Do you plan to retire in a rural or urban area? ?

Rural

Urban

What level of retirement income are you looking for? ?

No frills

Choices

Amount *

Inflation *

\$1,200

Weekly ▾

2.0%

Would you like to use New Zealand superannuation toward your retirement goal? *

Yes

No

Assets \$250,000 remaining to invest, \$100 remaining to save per week

Taylor's KiwiSaver Radio Station Cash in Hand Investment Property + Add new asset

Asset type: KiwiSaver ☒ Include in projection

Name *

Asset value *

Taylor's KiwiSaver

\$150,000

Asset contributions ?

Is Taylor currently employed? *

Yes

No

Employment type *

Self-Employed ▾

Gross salary (annual) *

Salary inflation *

\$400,000

3.5%

Voluntary contributions

Amount *

Inflation *

When does it start/occur? *

When does it end? (inclusive) *

\$10,000

Yearly ▾

3.5%

In the year ▾

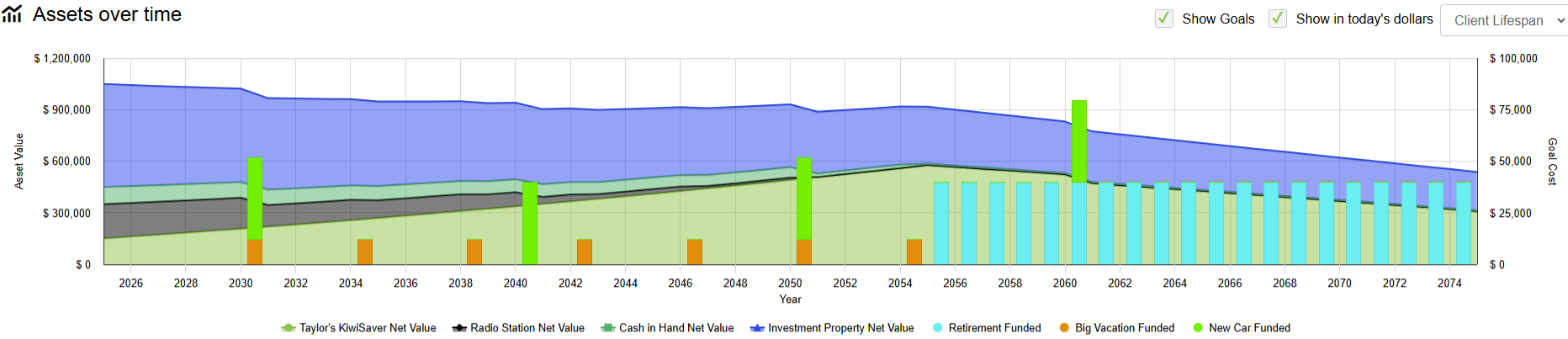
2025 ▾

When Taylor retires ▾

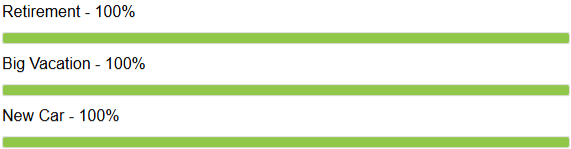
-1 year ▾

Add a contribution >

Assets over time



Goal Funding



Goals

Retirement Big Vacation New Car + Add new goal

Goal details: Retirement

Taylor's retirement age: 65 Taylor's life expectancy: 85

The following questions use research from Massey University to help you determine how much income you might require at retirement.

Do you plan to retire in a rural or urban area? Urban

What level of retirement income are you looking for? Choices

You will require an estimated \$769 per week in retirement to fund the retirement lifestyle you're after. You can alter this amount below.

Amount: \$769 Weekly Inflation: 2.0%

Would you like to use New Zealand superannuation toward your retirement goal? Yes

Assets \$250,000 remaining to invest, \$100 remaining to save per week

Taylor's KiwiSaver Radio Station Cash in Hand Investment Property + Add new asset

Asset type: KiwiSaver

Name: Taylor's KiwiSaver Asset value: \$150,000

Asset contributions

Is Taylor currently employed? Yes

Employment type: Self-Employed

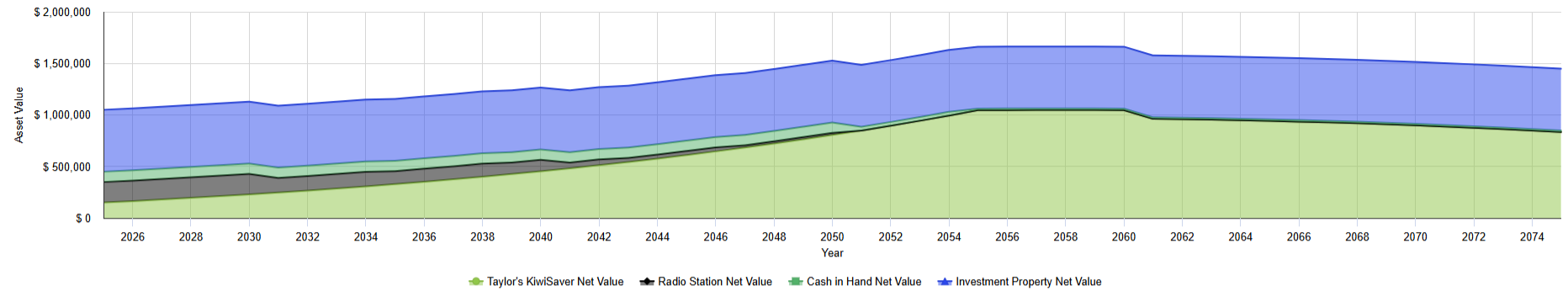
Gross salary (annual): \$400,000 Salary inflation: 3.5%

Voluntary contributions

Amount: \$10,000 Yearly Inflation: 3.5% When does it start/occur: In the year 2025 When does it end? (inclusive): When Taylor retires -1 year

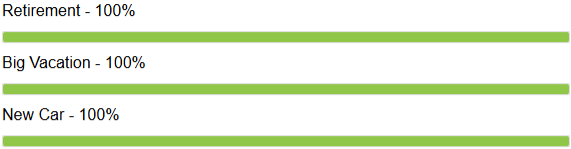
Add a contribution >

Assets over time



☐ Show Goals ☐ Show in today's dollars Client Lifespan ▾

Goal Funding



Goals

Retirement Big Vacation New Car + Add new goal

Goal details: Retirement ☒ Include in projection

Taylor's retirement age * Taylor's life expectancy *

The following questions use research from Massey University to help you determine how much income you might require at retirement. ?

Do you plan to retire in a rural or urban area? ?

☐ Rural ☒ Urban

What level of retirement income are you looking for? ?

☐ No frills ☒ Choices

You will require an estimated \$769 per week in retirement to fund the retirement lifestyle you're after. You can alter this amount below.

Amount * Weekly Inflation *

Would you like to use New Zealand superannuation toward your retirement goal? *

☒ Yes ☐ No

Assets \$250,000 remaining to invest, \$100 remaining to save per week

Taylor's KiwiSaver Radio Station Cash in Hand Investment Property + Add new asset

Asset type: KiwiSaver ☒ Include in projection

Name * Asset value *

Asset contributions ?

Is Taylor currently employed? *

☒ Yes ☐ No

Employment type *

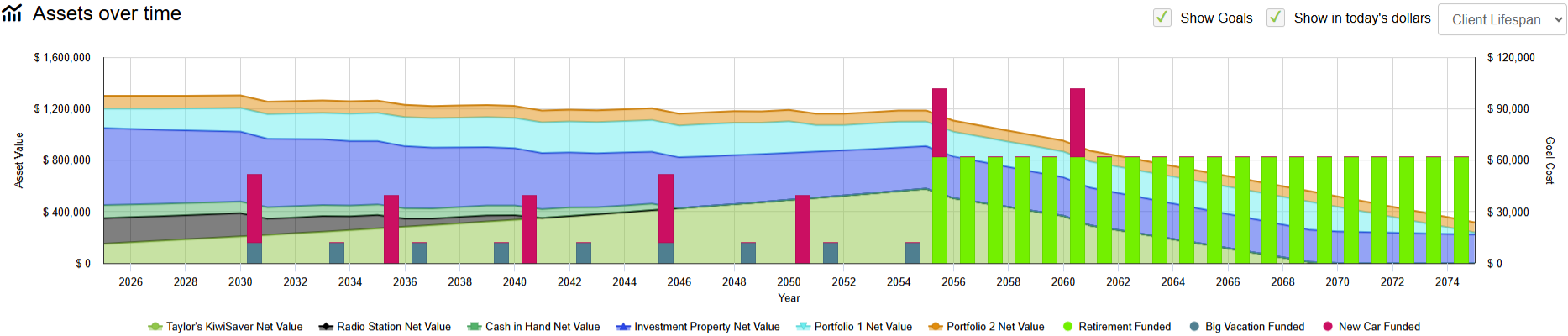
Gross salary (annual) * Salary inflation *

Voluntary contributions

Amount * Yearly Inflation * When does it start/occur? * When does it end? (inclusive) *

[Add a contribution >](#)

Assets over time



Goals

Retirement Big Vacation New Car + Add new goal

Goal details: Retirement

✓ Include in projection

Taylor's retirement age *

Taylor's life expectancy *

65

85

The following questions use research from Massey University to help you determine how much income you might require at retirement.

Do you plan to retire in a rural or urban area?

Rural

Urban

What level of retirement income are you looking for?

No frills

Choices

You will require an estimated \$769 per week in retirement to fund the retirement lifestyle you're after. You can alter this amount below.

Amount *Inflation *

\$1,200Weekly

2.0%

Would you like to use New Zealand superannuation toward your retirement goal? *

Yes

No

Assets \$0 remaining to invest, \$0 remaining to save per week

Taylor's KiwiSaver Radio Station Cash in Hand Investment Property Portfolio 1 Portfolio 2 + Add new asset

Asset type: Portfolio

✓ Include in projection

Name *

Asset value *

Portfolio 1

\$150,000

Asset contributions

Amount *Inflation *When does it start/occur? *When does it end? (inclusive) *

\$100Weekly2.0%In the year2025In the year2035

Add a contribution >

Return periods

Return type *Return *From *

Manual3%Now

Add a return period >

Build Version: 20250220.9

Swift, Taylor - Investment Statement of Advice 1.00 (1).PDF

3 / 35 | 100%

Relaunch to update

INVEST DEMO

Investment Statement of Advice

1

2

Table of Contents

3

Table of Contents

Summary4

Your details.....6

Your goals.....8

Your assets over time.....10

Your risk personality.....11

Investment plan.....12

Benefits and risks.....18

Next steps19

Appendix: Rationale20

Appendix: Risk Profile Results.....21

Appendix: Adviser Disclosure23

Appendix: Goal Calculations24

Appendix: Projections Disclaimer32

iINVEST DEMO

-
- Client Details
- Taylor's KiwiSaver
- Existing Assets
- Goals
- Taylor's Risk Profile
- Summary
- Projection
- Recommendations
- Advice Summary
- Report
- Implement

Implement

Please select the additional details to collect

- ☒ AML
- ☒ Tax details
- ☒ Nature and purpose
- ☐ Bank account details

AML Method *

CloudCheck

Manual

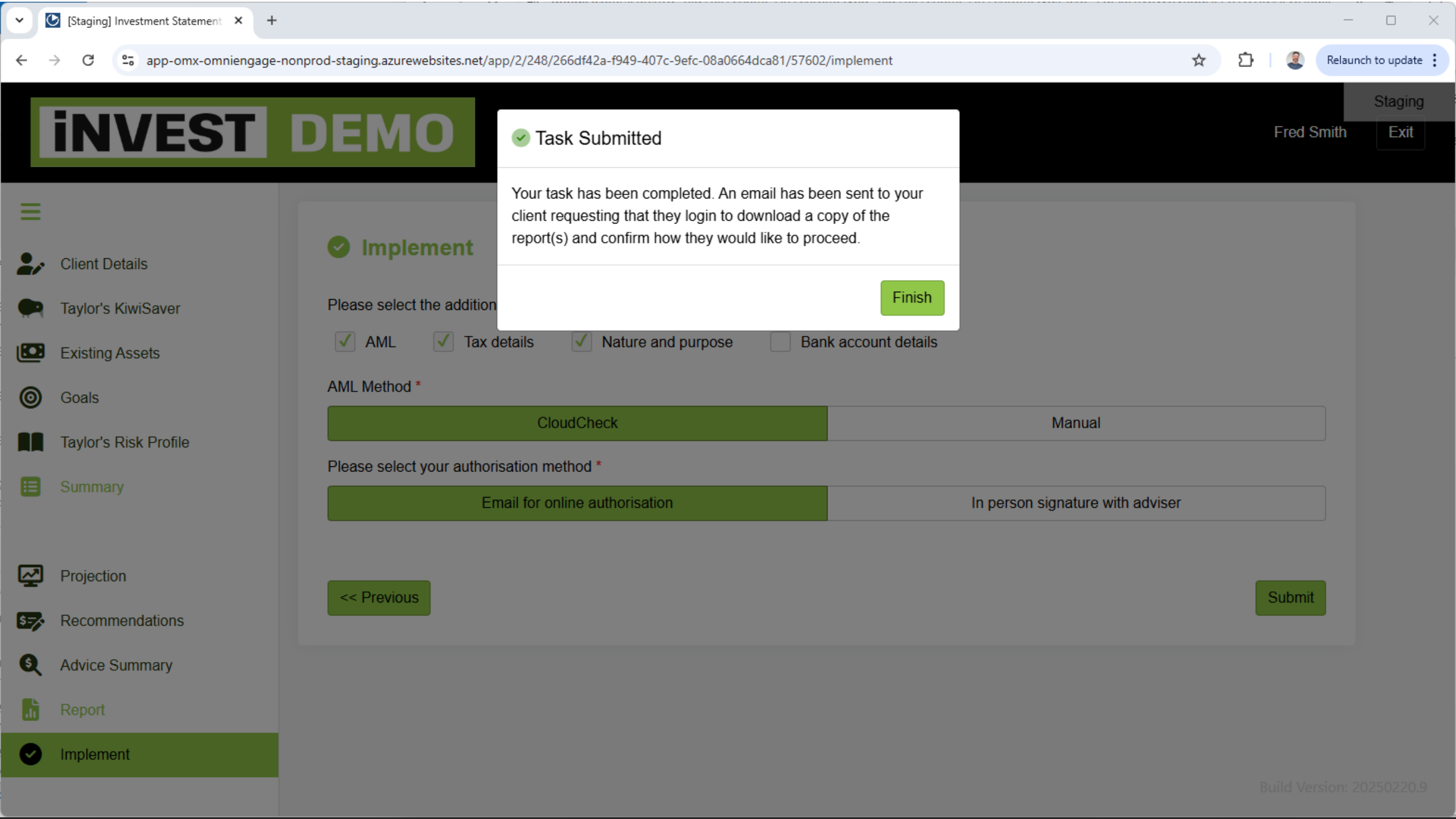
Please select your authorisation method *

Email for online authorisation

In person signature with adviser

<< Previous

Submit



iINVEST DEMO

Staging
Fred Smith
Exit

Relaunch to update

✔ Task Submitted

Your task has been completed. An email has been sent to your client requesting that they login to download a copy of the report(s) and confirm how they would like to proceed.

Finish

✔ Implement

Please select the additional

- ☒ AML
- ☒ Tax details
- ☒ Nature and purpose
- ☐ Bank account details

AML Method *

CloudCheck

Manual

Please select your authorisation method *

Email for online authorisation

In person signature with adviser

<< Previous

Submit

[illegible]

i**INVEST**

DEMO

Fred Smith

Exit

Do you have KiwiSaver? ? *

Yes

No

KiwiSaver provider *

ANZ Default KiwiSaver Scheme ▾

KiwiSaver fund *

Balanced Growth Fund ▾

Amount *

\$150,000

Remove fund

[Add another fund >](#)

☐ I don't know my fund

Are you making voluntary contributions to your KiwiSaver? *

Yes

No

Yearly voluntary contributions

\$10,000

INVEST DEMO

Fred Smith

Staging
Exit

Do you have KiwiSaver? *

Yes

No

KiwiSaver provider *

ANZ Default KiwiSaver Scheme

KiwiSaver fund *

Balanced Growth Fund

Amount *

\$150,000

Remove fund

[Add another fund >](#)

☐ I don't know my fund

Are you making voluntary contributions to your KiwiSaver? *

Yes

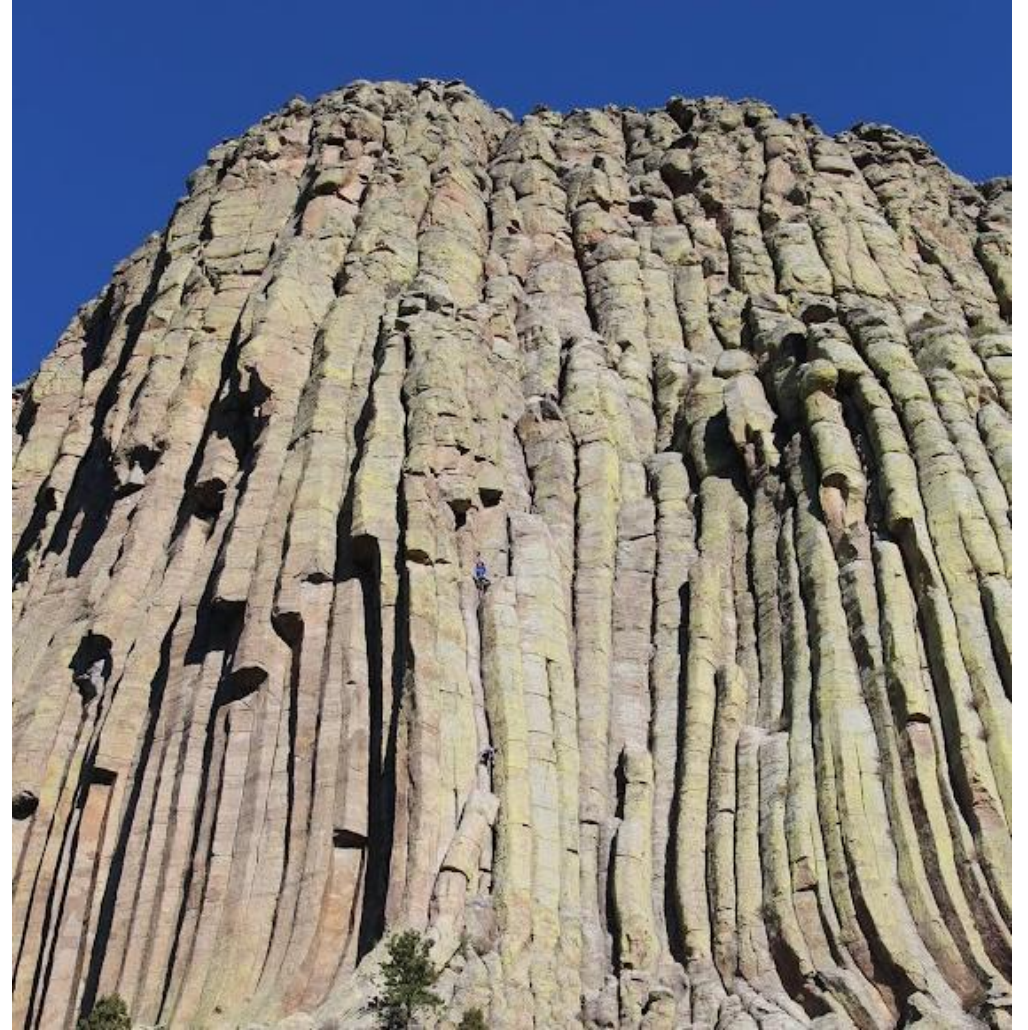
No

Yearly voluntary contributions

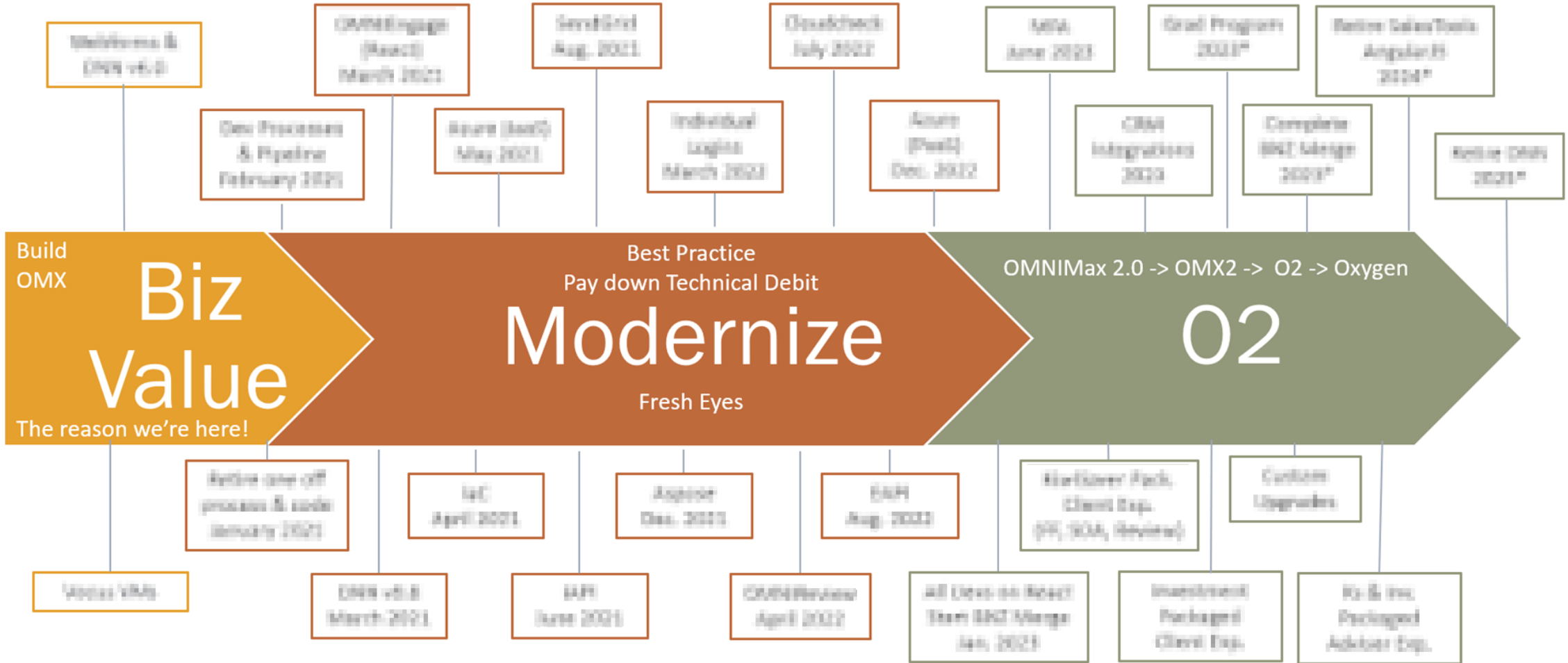
\$10,000

Challenges

- Implementing MFA with custom branding
- Framework we picked for charts only works on Linux
- Balance Roadmap against custom work – Legacy and O2
- Budget and Estimates
- Building a quality framework is just plain hard (new tech debt creeps in)



*OMNIMax Road Map



2021 to 2024+

*What's next?

- KiwiSaver product migration
- Brand new products
- Even more security
- New grads
- More components (Legos)
- AI
- New Technical Debt



What's the easy version?



***Topics for another day...**

- Hiring and keeping good people
- KPIs (hours and estimate)
- Security Audit and PENS testing
- Operations and Support

Contact me

- Personal Email: jjbutler74@gmail.com
- Work Email: jason.butler@omnimax.co.nz
- Personal Website: jasonbutler.com
- LinkedIn: linkedin.com/in/jasonjbutler
- Instagram: [@jjbutler74](https://www.instagram.com/jjbutler74)



What's wrong with this pic?

