THE USE OF APL IN SIMCORP DIMENSION

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DYALOG '16 , GLASGOW

SimCorp

OUTLINE
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Celebrating 50 Years With APL

SimCorp at a Glance

People in Development

Current Technology Stack

APL going forward

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THE WORLD'S **LEADING PROVIDER**
BRINGING INTEGRATED SOLUTIONS TO INVESTMENT MANAGERS

- Servicing the global buy-side market

- Established in 1971

- 1250+ Employees worldwide

- **250+ Developers**

- **2 Releases per Year**

- Headquartered in Copenhagen, Denmark

- Listed on Copenhagen Nasdaq

- USD 19 trillion managed on SimCorp Dimension®

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THE WORLD'S **LEADING PROVIDER**
BRINGING INTEGRATED SOLUTIONS TO INVESTMENT MANAGERS

MORE THAN
20
OFFICES GLOBALLY

MORE THAN
20%
OF REVENUE INVESTED IN R&D

MORE THAN
16,000
USERS

MORE THAN
40
YEARS OF DEVELOPMENT

MORE THAN
170
CLIENTS WORLDWIDE

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PEOPLE IN DEVELOPMNET
MANY COMPETENCES WORK TOGETHER

Investment Management Software requires many skills to develop, e.g.:

APL

- Math, Physics, Statistics
- Finance
- Computer Science
- UX Designers
- QA Analysts

SimCorp implements the Agile Development model called Scaled Agile Framwork (SAFe).

Meet Helen Evans
Business Consultant in IMS Consultancy
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Meet Ilaria Cataudella
Developer in Instrument Pricing
READ EMPLOYEE STORY

Meet Thierry Kelvin Ntwali
Senior Customer Service Consultant
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CURRENT TECHNOLOGY STACK
## LOTS OF CODE, MANY THIRD PARTY LIGRARIES, BIG NUMBERS, LOTS OF DATA

Language	#Lines	Year
APL	2,500,000	1971
C#	5,000,000	2004
C++	1,000,000	<1990
Ocaml	1,000,000	2000

Long lived code

Additional languages such as F#, Java, Python, Powershell, HTML5 web front end etc. are also used.

Dyalog APL integrates well with Windows

A large number of 3rd party libraries.

Source: http://informationisbeautiful.net

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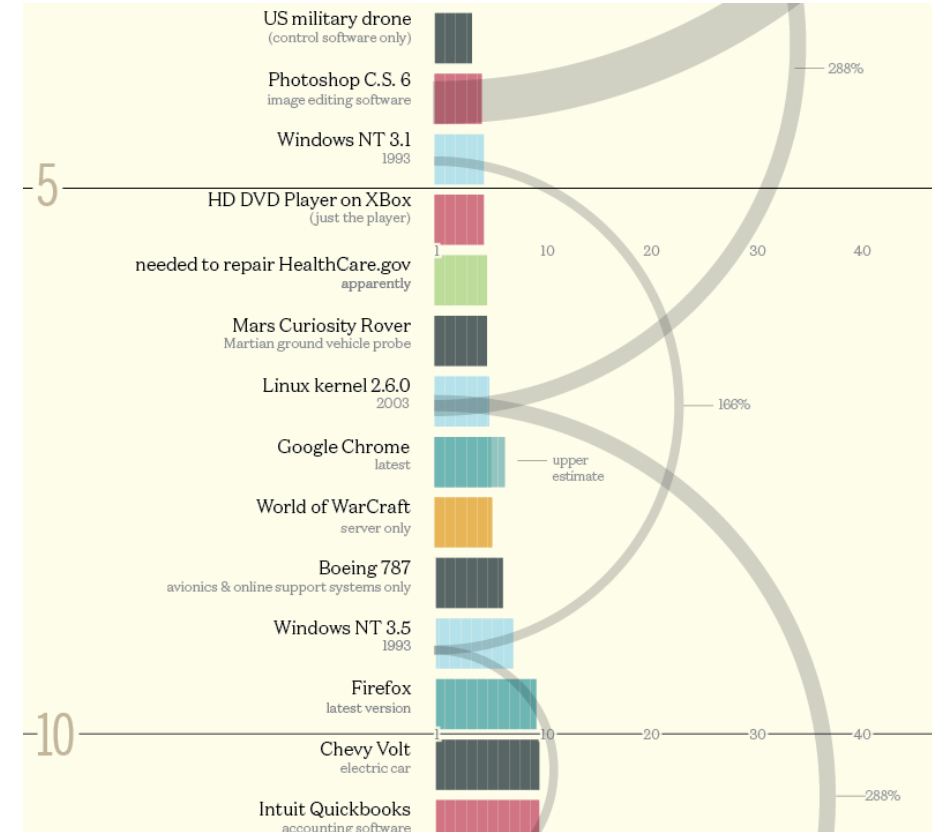
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DRIVERS FOR TECHNOLOGY IN SIMCORP
BUSINESS DRIVES NEW TECHNOLOGY – NOT THE OTHER WAY AROUND

APL is fairly easy to start using when you do not have a computer science background. Especially if you have a mathematical background.

C# was introduced to make modern multi threaded user interfaces with online calculations
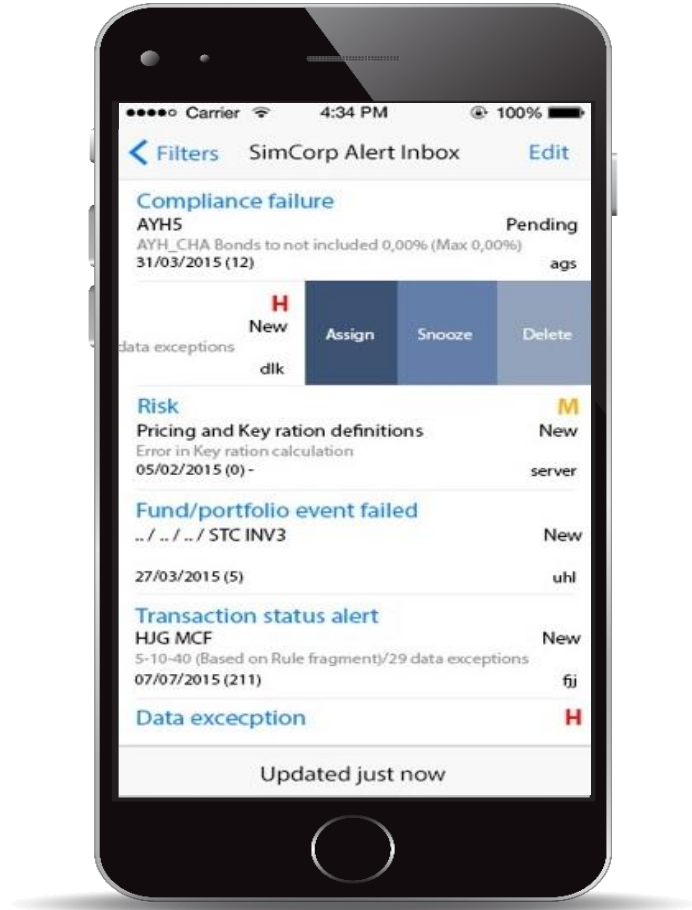
OCaml was introduced to accommodate for a combinator library (DSL) for financial contracts.

C++ is used for several low level high performing components.

HTML5 front end stack for web and mobile.

Cloud as future platform

Dyalog APL is cost efficient

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WHY IS APL COST EFFICIENT FOR SIMCORP
MANY YEARS OF FRAMEWORK AND ABSTRACTION

An extensive and easy to use APL framework.

UI redering, data syncronization, auditing, logging, authorization, form layout, etc. are abstracted in highly efficient framework code.

Developers, with math background, can focus on business logic. Operations on arrays are well understood abstractions.

Tracing and Debugging is well supported; even at customers.

Code running today will also run in 20 years.

Cost of APL form is less than C# form

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DIFFERENT TECHNOLOGIES ARE VISIBLE

APL, C#, OCAML, HTML5 - WHICH IS OK FROM A CUSTOMER PERSPECTIVE

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TRENDS AND TECHNOLOGY FOR THE ENTERPRISE
YOU SELDOM REWRITE AN ENTERPRISE SYSTEM LIKE DIMENSION

Enhancements are 30% new development and 70% extension of existing functionality.

Abstraction is key

Generation Y and Z.

Is C# legacy?
Technology driven

Increased demands and Moore's law dictates more parallelism.

Mutable data and state is problematic

Declarative languages are gaining momentum.

Java got Scala
C# got F#

Cloud as your platform.

Your new Operating System

Static type safety is valued with millions of lines of code.

Dyalog'14 presentation
SimCorp continues the effort.

When 64 bit floats are not enough

See nbim.no

Lifespan of modern technology

Web technologies comes and go

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APL GOING FORWARD, PART I

TOUGH DECISIONS

APL has been kept modern and feature rich by Dyalog.   Absolutely great and important work

Language centric extensions:

    Objects and classes are already available

    What about optional type information to create a static safety net?   It doesn't have to be perfect.

    What about type safe declarative extensions?   Imagine algebraic data types and higher order functions

    What about high precision numbers and large integers?   Dyalog APL can be first in class.

    Compilation is important

    Parallization   Make Futures & Isolates native part of interpreter. Include GPU's & optimize, optimize, optimize, …

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APL GOING FORWARD, PART II

TOUGH DECISIONS

Language centric extensions:

Memory efficiency is key to enterprise systems.   Continue optimizing the External Workspace concept

Keep going on smaller optimizations.   Constants, TimeStamps, …

Multiple APL instances   Shared R/W caches and External Workspace

IDE   Great work by opening up such that Visual Studio plugin's etc. can be made – because future will bring more and more technologies together

Cloud   Service orientation and Elasticity is key

Dyalog APL is a great tool of thought.

Now we just need support for multi-processors, big data volumes, well known IDE and a nice fit with cloud platforms like Azure and AWS.

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Congratulations with the 50 years

QUESTIONS?

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