

4D



4D v17 and beyond

A groundbreaking foundation for your business applications



4D V17

WHERE POWER IS HIDDEN BENEATH A VENEER OF SIMPLICITY

A set of features that will **unleash your ideas**
and help **solve your business challenges**.

4D v17 (and related R-releases) had convinced developers and end-users, during the beta testing phase, that with this version, the features and functionalities were stable and the **best of 4D**, yet.

4D continues to provide **24/7 support** to its customer base. In addition, 4D also spends time and research in modernizing the language, while innovating and maintaining the scalability, all within an effort to help you and your customers with your business applications.

With this ground-breaking release, 4D takes a quantum leap into the future, with 4D v17.

Thanks to **ORDA**, the way we manage data will never be the same. It's more than a programming language. ORDA will have a huge impact on the future of 4D features. 4D for iOS is a solution **integrated into 4D**, thus extending your business applications to mobile. New capabilities enlist a whole world of possibilities for both customers and developers. Some (but not all) are: **Dynamic forms** to build customer-specific forms on the fly; more programming tools to get closer toward object-oriented development; more **preemptive commands** for both Server and Client which result in ultimate performance; **enhanced security** and protection for business applications; and possibilities of creating a history manager, since your code can now be text-based. 4D Write Pro has an abundance of features. And more 4D View Pro functionalities are available.

I am impressed by what can be achieved with just a few lines of code, using ORDA and I admit that I've saved a lot of time compared to what I've already achieved in pure 4D. I am by no means blocked by the notion of pointers. I even managed to make «generics» using Form, objects or collections. The valuable information provided during the Summit is also available on the 4D Blog. It helps developers to take advantage of v17, which promises to be a revolution.

Patrick Emanuel (Director, Quality Association)

INCREASED PERFORMANCE

Along with increasingly powerful hardware, users naturally expect a corresponding increase in software performance. With numerous features and improvements, 4D provides developers the tools they need to satisfy their customers' demands, regarding performance.

Control the Cache Manager

4D v17 is based on 64-bit technology. Therefore, offers **unlimited storage options**. With 4D v17, developers can manage the cache themselves. Thus, allowing business processes to be prioritized and performance to be improved.

Employ the power of your hardware

4D v17 offers more preemptive commands.

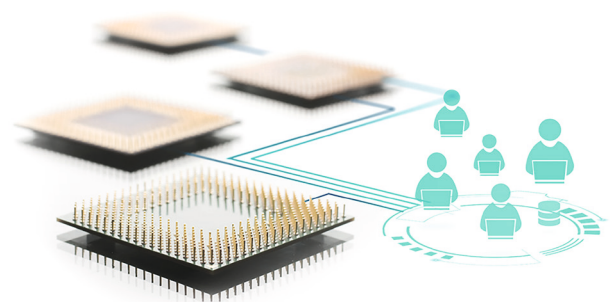
This denotes faster global execution time and more connected users. 4D lets you take full advantage of multi-core computers. 4D developers can now rewrite 4D code in such a way by using preemptive commands, thus creating noticeably faster applications.

More power for the Web Server

Requests to the web server are difficult to calculate. Many simultaneous requests mean an increased load, causing a loss in performance. From now on, you can rely on **preemptive processes for the 4D Web Server**. This will ensure faster responses to simultaneous requests.

Data exchange between processes

Use the power of **Shared Objects & Shared Collections**. These commands are simple yet provide a higher performance exchanging data between processes.



Preemptive on 4D Remote

Sometimes you need to run complex calculations or exports on the client side. Now you can use preemptive processes and start these actions without slowing down your end-users' productivity. Splitting an operation into pieces and **running it on all available cores, in parallel**, to get results faster.



ENTER A NEW DIMENSION

ORDA

With **Object Relational Data Access (ORDA)**, 4D has revolutionized the way data is accessed and presented. 4D combines the advantages of the **relational database** with those of the **object-oriented database**. Even complex relational structures are mapped internally like that of an object. 4D developers can use the entire database as a single object. **ORDA enlarges the dimensions of 4D** — and with 4D v17 we're just getting started.

A new way of data visualization

ORDA is very **user-friendly** and offers **powerful possibilities** of linking forms. For example, to display an Entity Selection in a list box, all you need to do is identify it as a data source. When using List boxes, you can directly display values and edit them.

"ORDA is a new way of thinking. It's not just a language. It's about relations, data access, using objects, and much more."

Thomas Maul (VP Strategy, 4D)

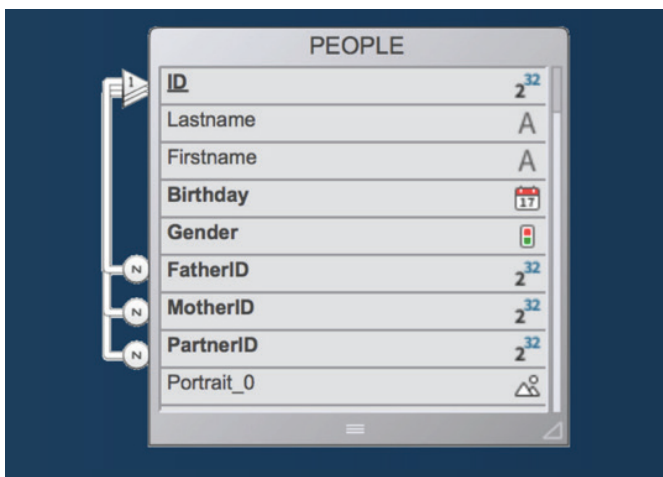
ORDA IN ITS GLORY

ORDA is multifaceted, so we are not able to discuss all of its dimensions in this brochure.

Therefore, we will use a family tree as an example.

ORDA allows you to address the entire database like an object.

We have an uncomplicated diagram. It includes **one table**, with **3 recursive relations** (they are the last names for: Partner, Father and Mother).



Access is now performed using the **Object notation**:

`$person.lastname`

for the last name,

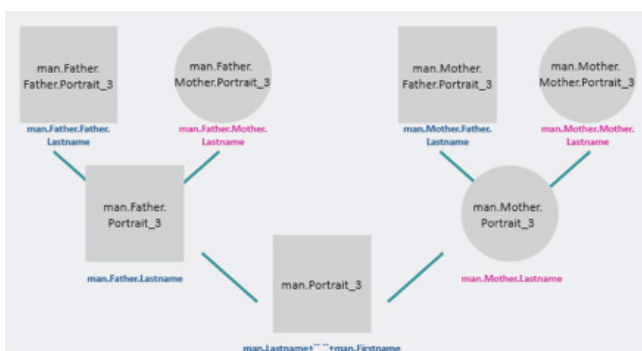
`$person.Father.Lastname`

for the last name of the father,

`$person.Partner.Father.Lastname`

for the father-in-law's last name.

ORDA takes great advantage of relations by allowing **easy navigation in the data model**. The name of the Relation is used as a path for the access. Here is the visual representation of the family tree:



Use a simple line to search for all grandfathers whose name begin with "Hans". Another search finds all siblings of grandchildren's siblings whose first name is Hans:

- `$persons:=ds.PEOPLE.Father.Father.Firstname="Hans"`
- `$sibling:=$_persons.Father.ChildrenAsFather.or($_persons.Mother.ChildrenAsMother).minus($_persons)`

4D PROGRAMMING LANGUAGE

MORE INTUITIVE THAN EVER BEFORE



With **efficient development** and **easy-to-manage deployment**, 4D applications are distinctive and only one of its kind. 4D continues to invest in this differentiation and intends to provide 4D developers with **innovative ideas and sophisticated tools** that are required for their business and productivity.

With 4D v17, a complete range of new features and capabilities are delivered.

OBJECT NOTATION: A new way of programming

This 4Dv17 feature drastically changes the way you write code and use the database engine. Coding is made **faster** and **easier to understand**.

Object properties are accessed using the «dot» notation:

`employee.name`

Object elements are accessible through square brackets:

`Contacts[2]`

Subobjects and their properties are defined by a series of «dots»:

`employee.children[2].age`

The code execution is **10 times faster** with the object notation than with the OB GET/ OB SET commands.

Long Live Objects

Objects have changed the way many 4D developers write code, making it **more generic, flexible, easier, and faster**. This feature represents a major step in object-oriented development. Just imagine, you could assign a formula (calculation or project method) as a member function to an object, pass parameters, or access the content of the object. With ORDA (or classic selection-based coding), objects become more powerful.

Keep an eye on your Server

4D completes the list of commands that give you the ability to **create your own administrative interfaces**, as dialogs on the server, client, or even as HTML pages for web access. Whether you want to hide information, add it, display it on a web page or simply access it using a smartphone, now, you can do it all!

When Collections meet Lightboxes

With 4D v17, you can easily **display a nested collection** in different list boxes. Without a single line of code, you can bind multiple list boxes in order to display the content. A content can be changed automatically, depending on the selected row in the list box. Just use an object or a collection as a data source for another list box. Then sit back and **watch the magic**.

History Control Support

Export the **structure file (.4DB) as text**, in several files. Since your code is text-based, it can easily be used with a source control system (such as Git). Now, the version history can be easily maintained, helping you with code review and debugging efforts.

COLLECTION: A very flexible array

4D introduces a new variable type called **Collection**. They're similar to objects or BLOBs. Collections can be used to hold **most types of variable** such as text, numbers, booleans, objects, and even other collections. The good news is; all of these variable types can be mixed within the same collection, while arrays can only contain the same type of elements.

InfoExample

Load result

Lastname: SmithDoctor: Emilia BERGSTROM

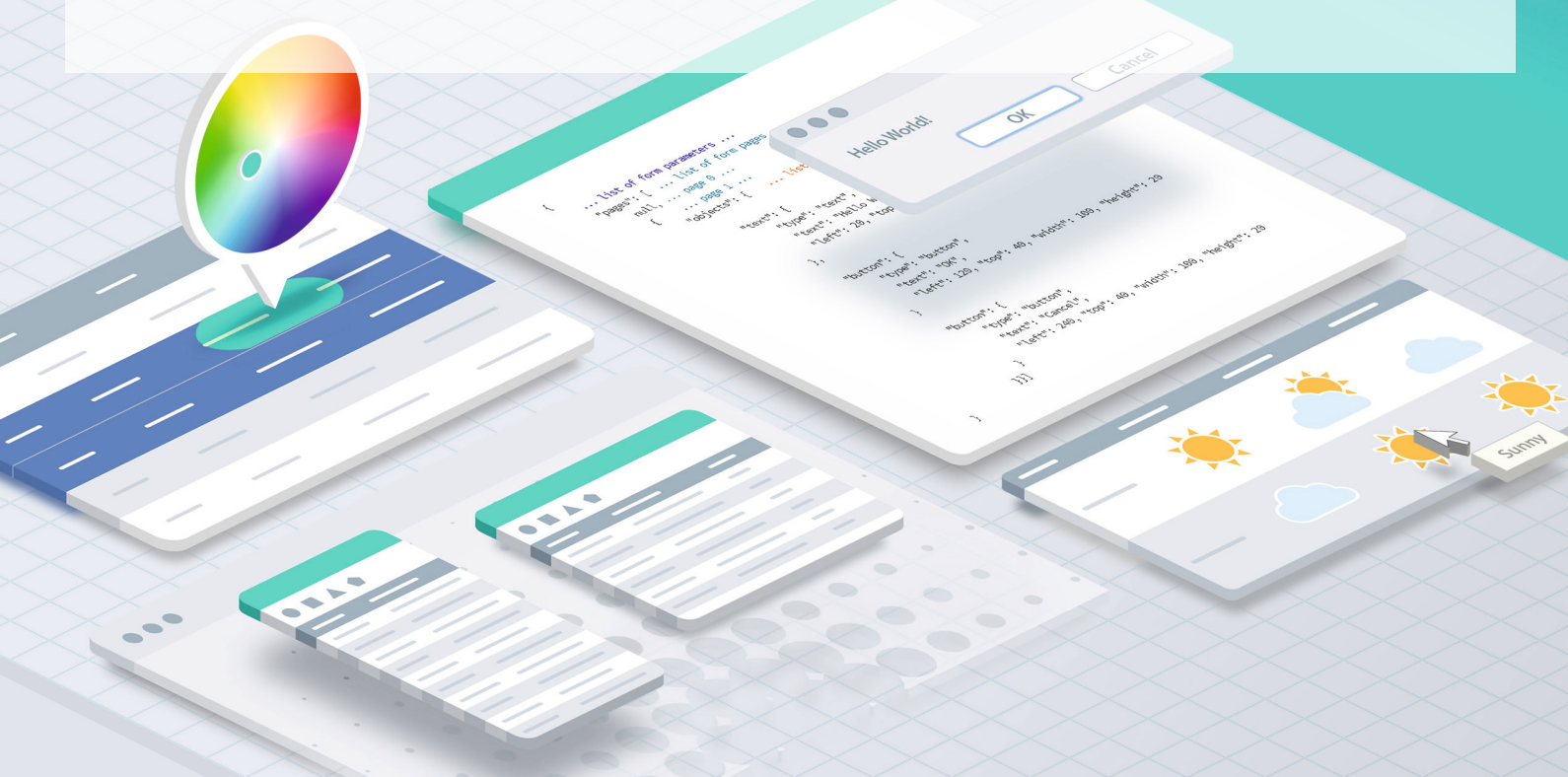
Firstname: EsteleExam date: January 4, 2018

Category	Test	Value	Unit	min	max
Metabolic	Albumin	6	g/dL	3,9	5
Lipoprotein	Aspartate aminotransferase (AST)	8	g/dL	3,9	5
Hematology	Bilirubin	47	mg/L	10	19
Immunology	Calcium	8	mg/dL	9	10,5
	C-Reactive Protein (CRP)	13	mg	0	1
	Chloride	6	mEq/L	98	106
	Phosphorus	10	mg/dL	2,4	4,1
	Plasma appearance	Clear			

C-Reactive Protein (CRP):

Quisque vitae ex at purus vehicula luctus. Donec cursus, purus quis aliquam efficitur, odio tellus ultricies risus, non maximus libero justo et dui. Duis id nulla at odio porta imperdiet eu tempor sapien. Etiam pretium a arcu tincidunt venenatis. Phasellus dignissim sem quis sem scelerisque, quis posuere velit ornare. Pellentesque vitae neque lacinia, accumsan nibh sit amet, porttitor neque. Cras luctus, nisl vitae vestibulum vehicula, purus eros malesuada metus, non mollis est enim sit amet ipsum. Vivamus lacus libero, tempus semper lacus vel, blandit blandit felis. Morbi quis eleifend elit. Ut rhoncus non tellus sit amet blandit. Ut tincidunt, neque ac gravida fringilla,

USER EXPERIENCE TO INCREASE CUSTOMER SATISFACTION



Let's face it; most of your users will never see your code, but they will decide on whether the application is good or not. **A modern user interface and easy-to-find features** simplify 4D development. 4D v17 can provide multiple tools to help you design applications that adapt to your users' needs starting at early stages of conception. Thus, delivering an interaction that's robust and more intuitive.

Discover the power of dynamic forms

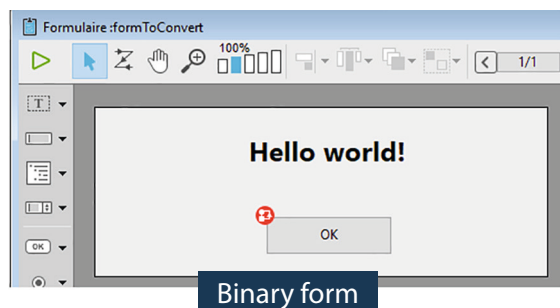
It's more efficient to create forms based on various business requirements **without the need to add or change any code**. Dynamic forms allow you to build forms that are fully adaptable to your end-users' needs. The advantage of the new forms vs. regular binary forms is you can modify them just by **updating the JSON file**, without having to recompile the application. This gives you great flexibility in deployment.

SDI Mode: A new era for 4D applications on Windows

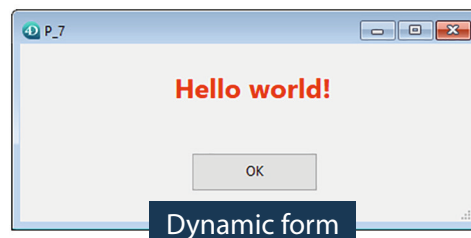
A huge step forward for Windows applications UX is the SDI mode. **Single Document Interface** is now supported. Just apply a single checkbox for your application to have a main window, which can now open many additional and independent windows.

Your binary forms are not going to waste

Dynamic forms are made easier! 4D introduced a command allowing the **conversion from binary forms to dynamic forms**. Not satisfied with the font... font size... colors... dimensions? The command returns an easy-to-manage object allowing you to redesign a form on the fly. The possibilities are endless.



```
C_OBJECT($dynForm)
$dynForm:=FORM Convert to dynamic("FormToConvert")
$dynForm.pages[1].objects.TitleArea.stroke="red"
$dynForm.pages[1].objects.bOK.method="myMethod" //associate a project method
DIALOG($dynForm)
```

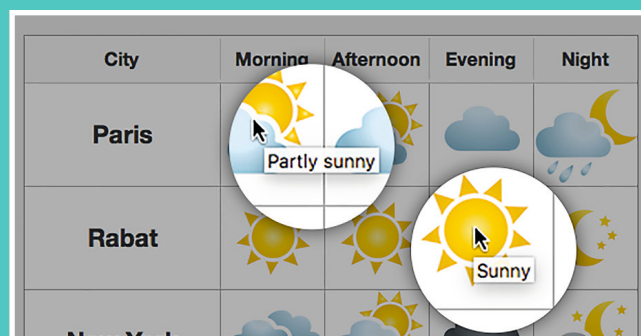


List boxes: A key tool for UI

The functional scope of the 4D list box increases with additional features.

Help tips for list box cells

Help tips are very useful, as they simplify the user interface and help users understand objects that sometime aren't self-evident. With two new commands, **you can display a help tip** when the mouse pointer hovers over a cell. The user experience is immensely improved.



New commands to manage list boxes

With 4D v17, we also extend the command sets to control the list box properties. 4D developers provide these to allow **users who are customizing list boxes**. Background color or fonts are therefore, easily customized.

Automatic line height

You can easily set the **automatic row height** in the properties of a list box. This allows you to create a clear list without programming. Because a list box can adjust the height of **each row** to its content, the full text or picture can be displayed. Thus, avoiding all kinds of wrapping issues. This feature is available with a 4D View Pro license.

Picture	Name	Short text
	ABORT	The ABORT command is used form within an error-handling project method installed using the command ON ERR CALL .
	ASSERT	The ASSERT command evaluates the boolExpression assertion passed in paramete and, if it returns false, stops the code executio with an error message. The command works i interpreted and compiled mode.
	Asserted	The Asserted command has an operation similar to that of the ASSERT command.

BECAUSE SECURITY MATTERS...

4D solutions have always been **safe and stable**. To keep its consistency, 4D invests heavily in developing and updating security features. With 4D v17, 4D delivers an expansive range of **new security functions**.

Data Integrity

With 4D v17, developers can use the **SHA2 standard** to ensure data integrity during data exchanges or comparisons. 4D v17 supports SHA256 and SHA512, which are considered to be the most secure hash functions, to date.

Secure Websites

Your 4D Web Server inherently is at the highest level of security. And with **PFS (Perfect Forward Secrecy) support**, the Web sites that are provided by the 4D Web Server are ranked A+ in security.

Enterprise Feature – SNAPSHOTS

In the Enterprise segment, **VSS Writer snapshots** are made to help administrators, and facilitate the management of multiple systems. 4D v17 supports this enterprise feature. Now, 4D can also be used in complex and large IT infrastructures.

Secure Server Communications

4D v17 protects your web and client server connection with **TLS 1.2**. This protects communication in the event of an attack and also prevents data from being compromised.

New commands for password hashing

Do not take any risks when securing passwords. With two new commands, you can now hash the passwords of your users to ensure maximum security. The **Hash technology** does not allow the decryption of passwords. Therefore, this is much more secure than simple encryption.

Security is often underestimated!

**Achim Peschke (Technical Manager,
4D Germany)**

4D developers should always ensure that their development is equipped with the **latest standards provided by 4D**. Backup and log files are also **essential**, in order to secure a business application.

4D WRITE PRO

CHOCK-FULL OF FEATURES

4D Write Pro a **powerful text engine**, entirely programmable, and **fully integrated to 4D and its database**. 4D Write Pro covers most of the features of its predecessor, 4D Write. However, 4D Write Pro can do much more. With the integrated text engine, users can design letters, create invoices, catalogs, reports and many other desktop publishing functions.

Its uses are unlimited.



Delivery note and invoices

Create clear documents with tables

With real tables you can create and arrange delivery notes or invoices. Save them directly as PDF files and send them directly from 4D. Export them to a Microsoft docx format or display them on the web.



Advertising letters and catalogues

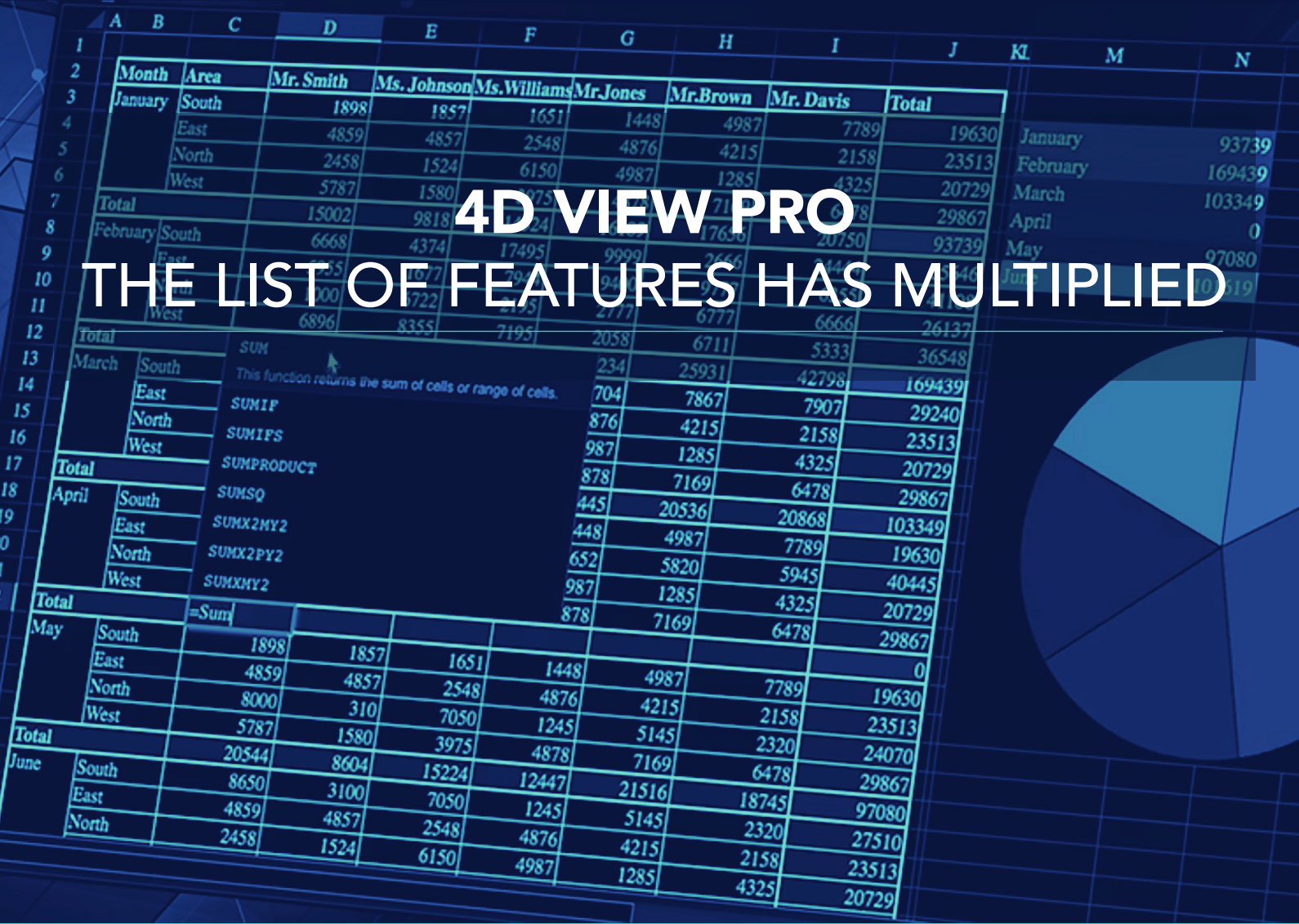
Pictures speak a thousand words

With 4D Write Pro, you can use full-area background graphics and position images easily in the document. Full control over picture insertion is offered. Create stunning layouts that influence your customers.

Personalized menus

Users get only the features and menus they need

With 4D Write Pro, developers have the option to provide users with specific tools, based on their projects. In addition, you can secure the corporate identity of your company by defining the available fonts or using the appropriate logos.



4D View Pro allows you to take full advantage of **integrated, powerful spreadsheets**. They give your business the tools it needs to make the most of their data.

Support of Microsoft Excel (xlsx format)

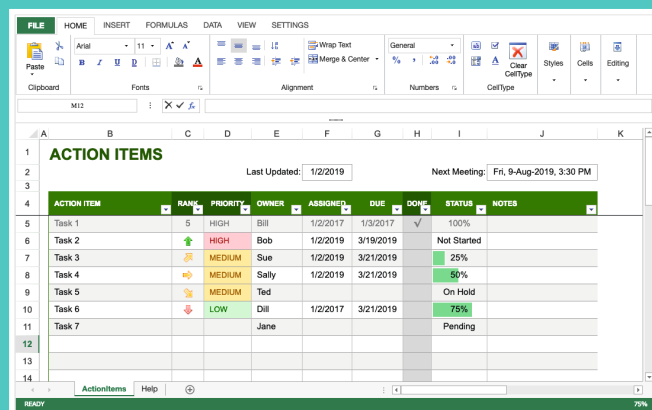
You need to give your manager the monthly revenue report. Your manager wants to read it on his/her laptop, even when not connected to the 4D database. A convenient solution would be to compute it using 4D View Pro. Then, **export it to a Microsoft Excel format**, and send it to your manager. This way he/she can read the report using Microsoft Excel, even when offline. You can also save it as a PDF and send it in an email. The possibilities are endless! Your 4D business applications are taken one step further, by better integrating with the **Microsoft Office environment**.

Yearly Budget Calculator

	JAN	FEB	MAR	APR	MAY	JUN
Starting Cash Balance:						
Total CHARTER / GIFTS						
% of Income						
HOUSING						
Mortgage/Rent						
Home/Rental Insurance						
Real Estate Taxes						
Furnishing/Appliances						
Lawn/Garden						
Maintenance/Supplies						
Improvements						
Other Home Expenses						
Total HOUSING						
% of Income						
UTILITIES						
Electricity						
Gas/Oil						
Water/Sewer/Trash						
Phone						
Cable/Satellite						
Internet						
Other Utilities						
Total UTILITIES						
% of Income						

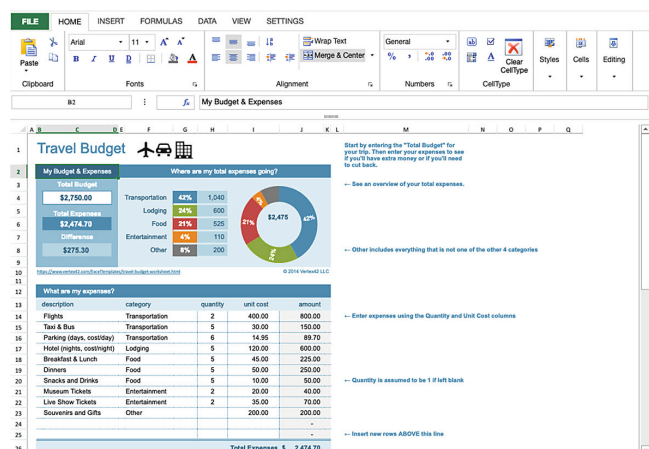
Spreadsheet

The 4D View Pro spreadsheet is a powerful tool allowing **businesses to unlock their data's potential**. Build eye-appealing charts, use built-in formatting to bring important data to the first lines, and perform mathematical operations, thanks to formulas and functions.



Interact with your document by programming

A set of commands are provided to **fill your document via programming**. You can set the data as labels, database fields, or as formulas, all within your document. And if you can set it, you can get it, too! You can retrieve cell formulas or values, entered by your users.

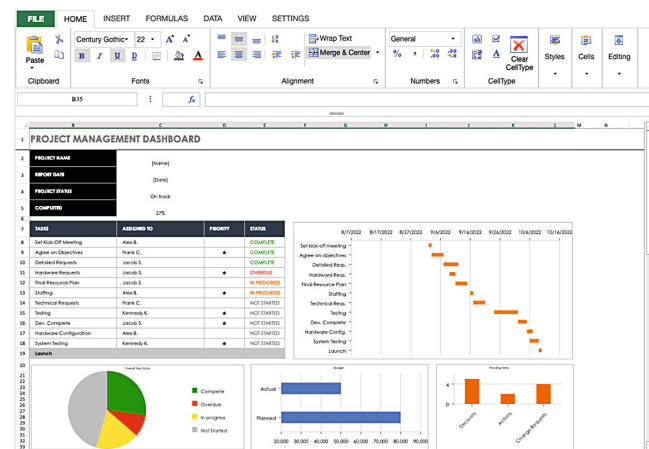


You're the master of your data

Full control is granted over which data you choose to make available to your end users, as well as, what fields or methods will allow access.. Simply put, **your database has heightened its security**.

Enhanced UI with a powerful toolbar

UI is all about personal preference, and 4D introduces a new feature to help customize the 4D View Pro interface. You have the choice to include in your document, a **Toolbar with multiple tabs** so you can organize information and quickly switch between different actions.



Convert from 4D View

The existing 4D View documents are very important to your customers. Converting them to 4D View Pro is a priority for us. With 4D v17, **this conversion is done with a single line of code**, thanks to a new dedicated command.

CREATE AN IOS APP FROM 4D WITH EASE

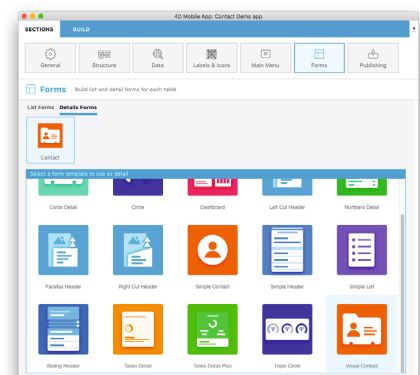
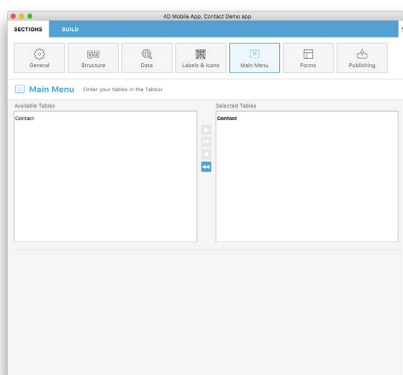


Are you in a business where you need to constantly check something? For example, unpaid invoices or customer quotes? Perhaps you also need to perform a quick search for a product reference in order to answer a customer question?

4D for iOS is designed to address these needs.

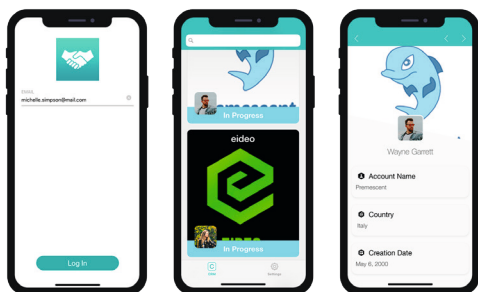
App-Development – no experience required

Start the 4D for iOS project editor and **select the desired tables and fields**. Just a few more steps to set up your project. Choose the desired **template from a wide range of samples**. 4D will do the rest.



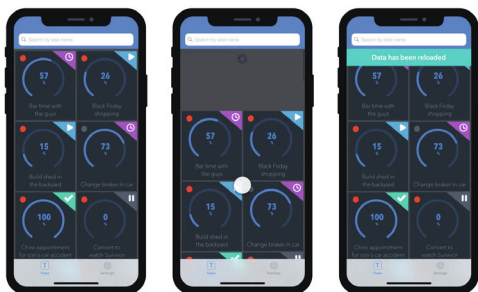
Restricted queries

Imagine you're an account manager and you want to consult your In-Progress contracts simply by connecting to your app using your email address. Or you might want to synchronize only the invoices from last year or customers of a specific sales team, filtered by region. **All of this is possible**, thanks to restricted queries. Embedding and displaying filtered content in your 4D for iOS app is a piece of cake.



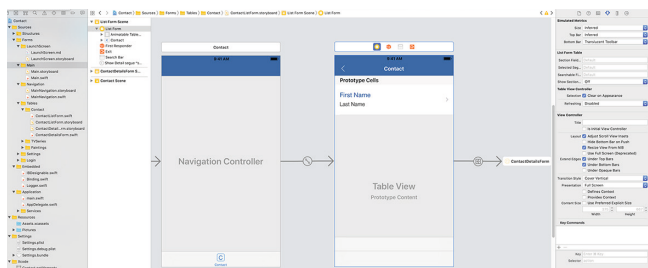
Pull to refresh

Pull-to-refresh (or swipe-to-refresh) is available with 4D for iOS. All you have to do to refresh your data, is scroll to the top of the screen, then slide your finger down, one more time. Very intuitive. Your app content is now, up-to-date.



XCode offers more possibilities

We created a **natives XCode project**. Now, every developer can extend the project. You're not limited.



Offline and secure

We've designed 4D for iOS to **work offline**, as well. Therefore, you always have your data at hand, even when there is no network available.



Move beyond the basics

We shipped 4D for iOS with a **large icon library**, various **form templates** to cover most of your business needs, and data formatters for content to be displayed correctly. However, if all of the above is not enough, you can add your own icons, customize your templates, and create additional data formatters.



Simplified licensing

Licensing is as simple as development. A 4D Server (macOS or Windows) v17 R2 or newer license is needed to deploy 4D for iOS apps. **There's no additional license needed.** Your 4D for iOS apps will share the same licenses as those for 4D Remote (client).

ARE YOU READY TO STEP INTO ANOTHER DIMENSION?

Go ahead with 4D v17



- **ORDA** – A revolution in 4D v17 that will change the future work of developers and users.
- **4D language** - New tools that represent a major step in object-oriented development.
- **4D for iOS** - To build your business application directly within 4D.
- **Increased performance** - More processes, more users, more power.
- **4D Write Pro** – Exceeds 4D Write on many levels.
- **Custom administration dialog** – Keeps a watchful eye on your server.
- **4D View Pro and powerful spreadsheet** - Unlocks your data's potential.



4D SAS
66 route de Sartrouville
78230 Le Pecq - France

contact@4D.com
+33 1 30 53 92 00

www.4D.com
blog.4D.com

  
@4Dsoftware

Copyright 4D SAS 2019 • All rights reserved