

# Creating Dynamic References in Universes

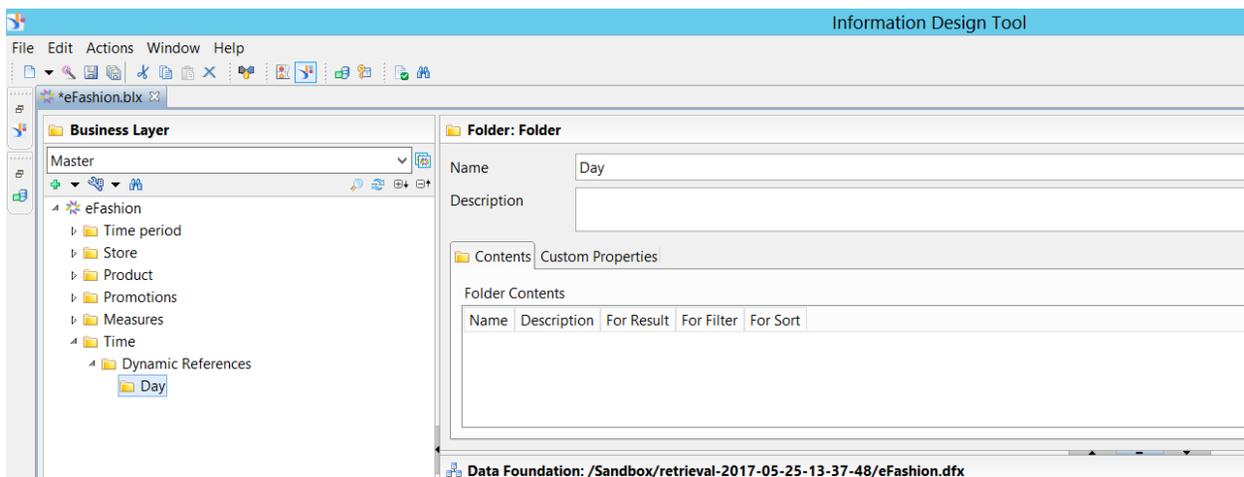
This is a guide to create easy dynamic references in a universe for easy dynamic date filtering in BusinessObjects. The following steps are for universes based off HANA Analytic and Calculation Views.

A common ask from a client is automation, and we are definitely fans. It's preferable to write a report once, then not have to touch it again, a la the old Ron Popeil adage: "Set it and forget it." There are many Web Intelligence documents that are time-based analyses. Perhaps a year-to-date (YTD) report that compares the current year over the previous three years. Without some kind of dynamic date in there for filtering, we are stuck constantly updating the date. If this report is also on a scheduled burst to users, updating the date range becomes a monthly (even weekly) activity. Who wants to keep doing that?

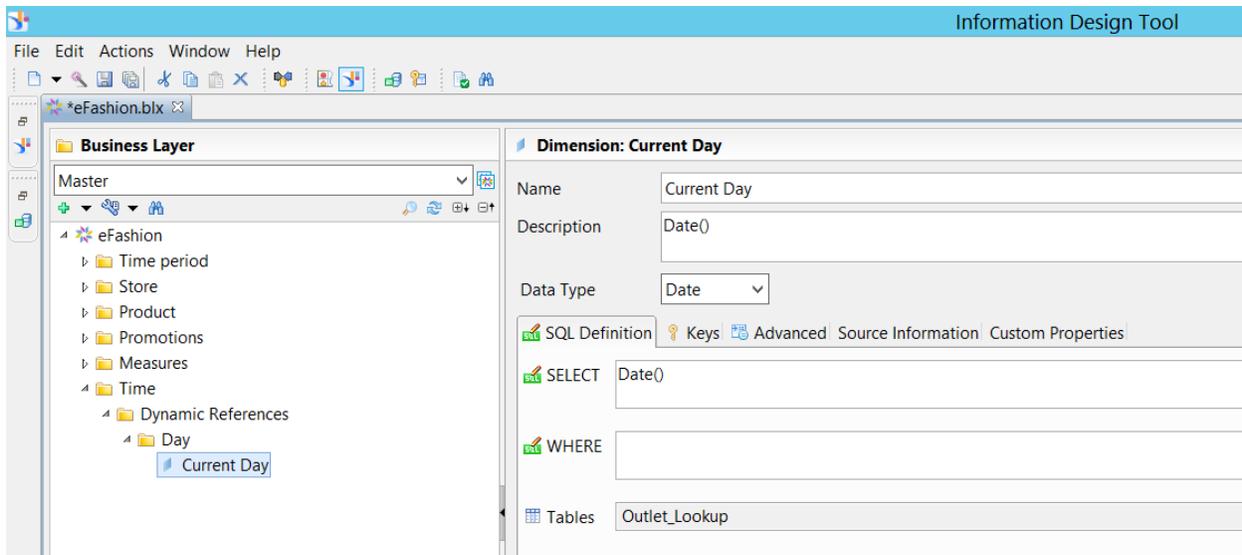
We recently implemented a solution with one of our clients that offers a plethora of dynamic date options to use as filters in Web Intelligence. Given that we can filter a date dimension by another object in the query, we can use these dynamic dates to always return the appropriate dates regardless of when they are run/bursted. Let's walk you through the steps to create them in a universe via the Information Design Tool (IDT).

## 1. When is now?

The first step is to create the current date. Organizationally, we are going to create additional folders and sub-folders to make it easier for our users. Let's create a few folders and subfolders:



Now we'll create a new dimension:

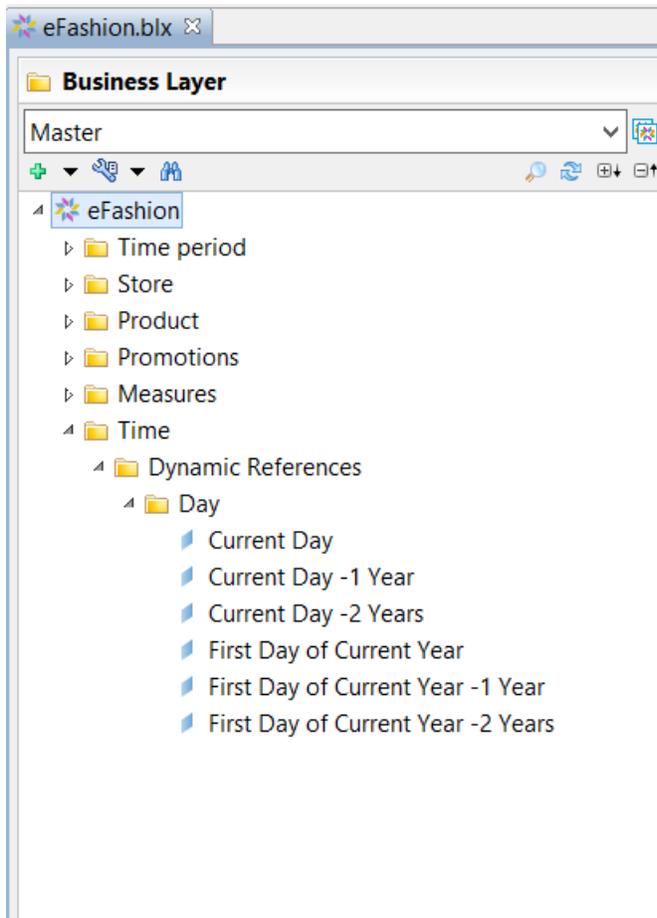


A few things to note here:

- Since this is an actual date containing day, month and year, we can (and should) set the data type to Date. This will allow us to use this as a reference filter against other dates.
- We've built this against the eFashion universe, which has a Microsoft Access Database as its underlying data source. The syntax in the SELECT box is entirely dependent on the database which you are using. In Access, the code for the current day is <Date()>. If this was a HANA-based data source, the code would be <Current\_Date>.
- In order for you to validate the code is correct, a table must be referenced. Any table in the universe will work. This is truly for validation only, as this reference will work fine in data preview or in a query without that table reference.

## 2. Building the rest of the formulas for YTD three-year comparison

Now, let's build out the rest of the relative dynamic dates necessary for our YTD three-year comparison. The way we will set up the query filter in Web Intelligence is by setting up three ranges of a date with ANDs between them. So we will need a date for the beginning of the year, current date, beginning of last year, current date -1 year, beginning of two years ago, and current date -2 years. These will all be individual references. Here's what we added (code will follow):

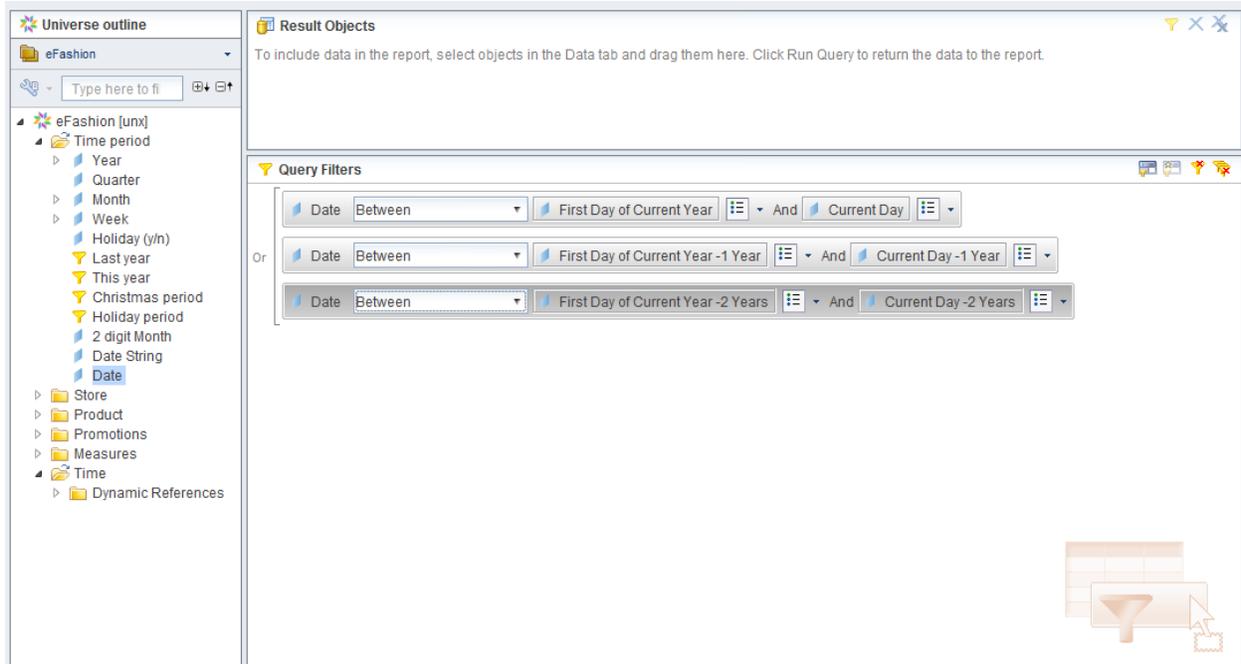
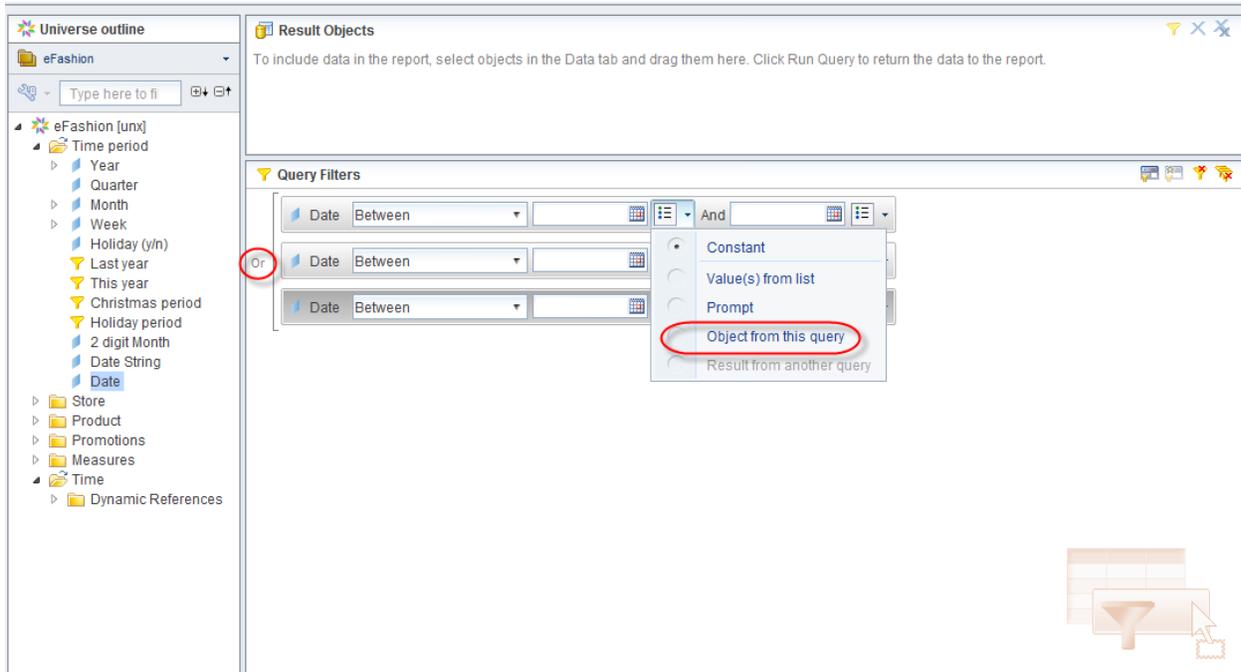


Code for these 6 dimensions are as follows:

Field Name	MS Access Syntax	SAP HANA Syntax
Current Day	Date()	Current_Date
Current Day -1 Year	DateAdd('yyyy', -1, Date())	Add_Years(Current_Date,-1)
Current Day -2 Years	DateAdd('yyyy', -2, Date())	Add_Years(Current_Date,-2)
First Day of Current Year	Format('01/01/' & Year(Date()), 'mm/dd/yyyy')	To_Date(To_Char(Current_Date, 'YYYY')    '01'    '01')
First Day of Current Year -1 Year	Format('01/01/' & Year(DateAdd('yyyy', -1, Date())) , 'mm/dd/yyyy')	To_Date(To_Char(Add_Years(Current_Date, -1), 'YYYY')    '01'    '01')
First Day of Current Year -2 Years	Format('01/01/' & Year(DateAdd('yyyy', -2, Date())) , 'mm/dd/yyyy')	To_Date(To_Char(Add_Years(Current_Date, -2), 'YYYY')    '01'    '01')

### 3. Using the references in a Web Intelligence document filter

After pushing our universe changes up to the repository, we can now build from it. Remember, our goal is to compare three years of YTD performance. Given that we are using the eFashion universe, we only have month/year available (and old dates to boot!). We created a date field by adding 01 to the month/year, then converted it to a date. Due to the old dates, this will not be the best example of our dynamic dates, but this is the filter setup that we would need in the Web Intelligence filter:



Given a current date of June 1<sup>t</sup>, 2017, this method and filter will give you the following date ranges:

- 01/01/2015 – 06/01/2015
- 01/01/2016 – 06/01/2016
- 01/01/2017 – 06/01/2017

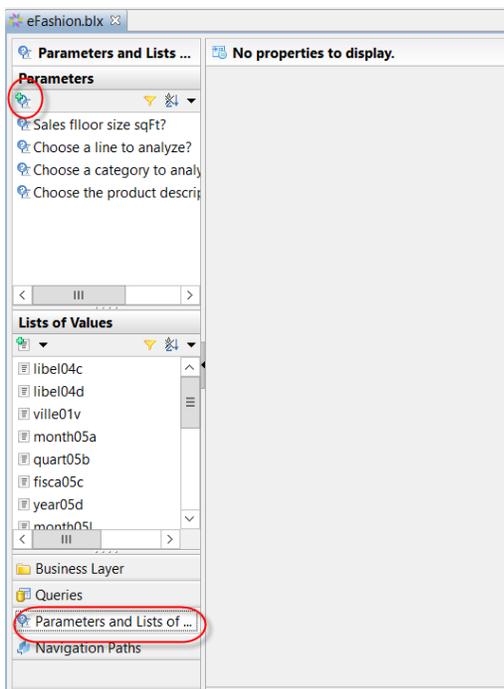
Due to our date references being dynamic based on the actual current date, these date ranges will fluctuate day to day, year to year... all without the need to constantly update them for users.

## 4. But we want more!

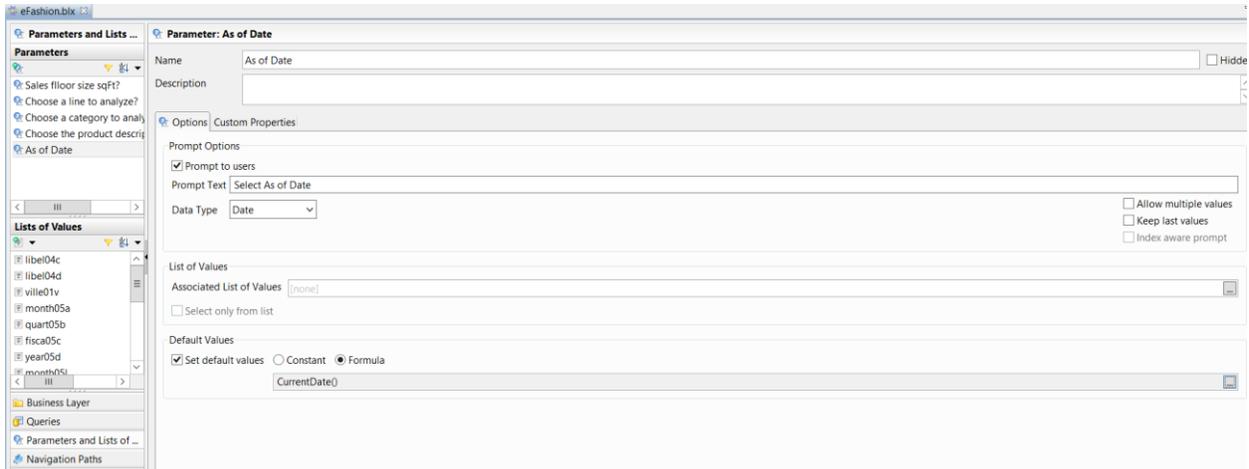
Sure, those dynamic dates are great and all, but what if a Web Intelligence publication messes up at a crucial end of month report? We know, this would never, ever happen. Let's just pretend that it could happen. We now have a finance manager asking for a first quarter, year-over-year report in mid-May. These dynamic dates care not what you want, but what the actual current date is. We can take it a step further though. For our client, we created a prompt that we called "As-Of Date." Yes, the name is clunky, but it's the easiest way to conceptualize what we are trying to do. We want to run a year-over-year report with the same filters as above, only we want to run it "As Of" 3/31/17. Furthermore, by creating the prompt in the universe, we are able to set the default to our current date. This will allow us to just run the report with an "OK" in the prompt screen during refresh or still be able to set up our publications and forget about them. It will, though, allow for flexibility in case we need to run the report for a different span of dates. First, let's create the Prompt in our universe.

## 5. Prompt with a dynamic default

With the universe business layer pulled up in the IDT (still using eFashion), head to the Parameters and List of Values section. Click the + button in the top left to create a new Prompt.

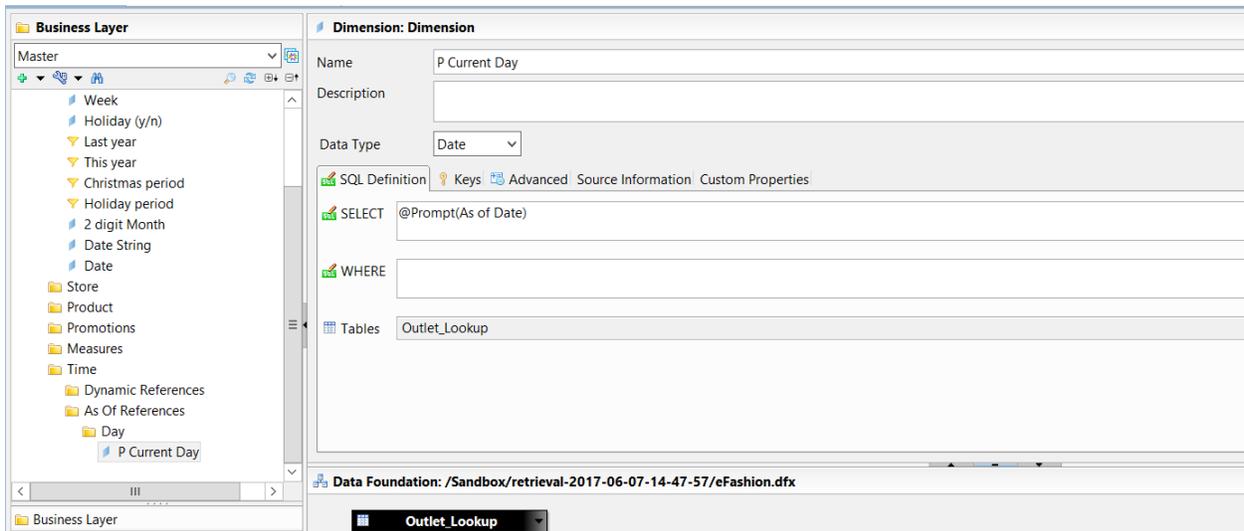


Below is an example. Notice that we unchecked "Allow multiple values" and "Keep last values" and switched the Data Type to "Date." We set the default to a formula, namely `CurrentDate()`. This will give us the current system date.



## 6. Building the references to the prompt

WNow, let's create our first prompted reference dimension. Head back to the Business Layer. We created a second subfolder under Time called As-Of References, then a folder under that called Day.

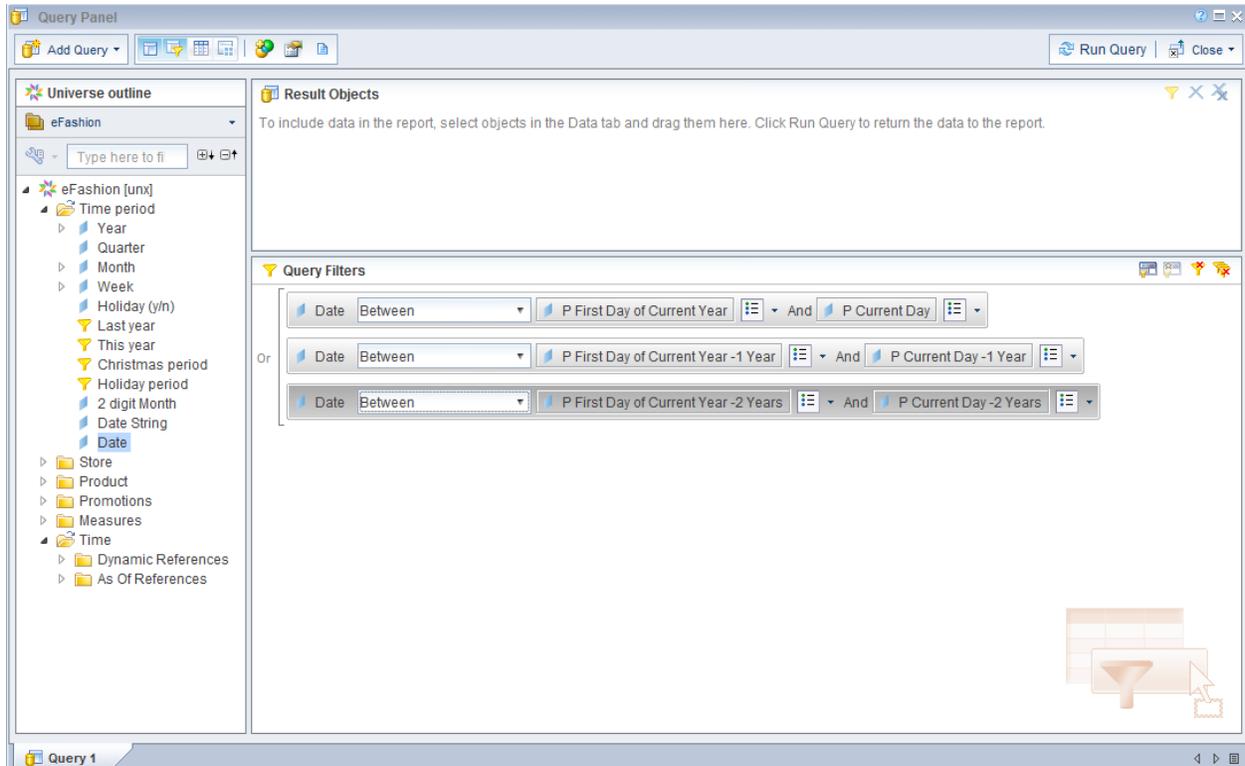


Above is our first reference dimension "P Current Day." Anytime this (or any other reference that contains the prompt) is used in a Web Intelligence report, the prompt screen will come up. Since we are using the same prompt, though, you'll only have one prompt to answer that will satisfy them all. In order to match our report, we will need current day, first day of current year, current day -1 year, first day of current year -1 year, current day -2 years, and first day of current year -2 years. Here are the formulas for both Microsoft Access and HANA based universes:

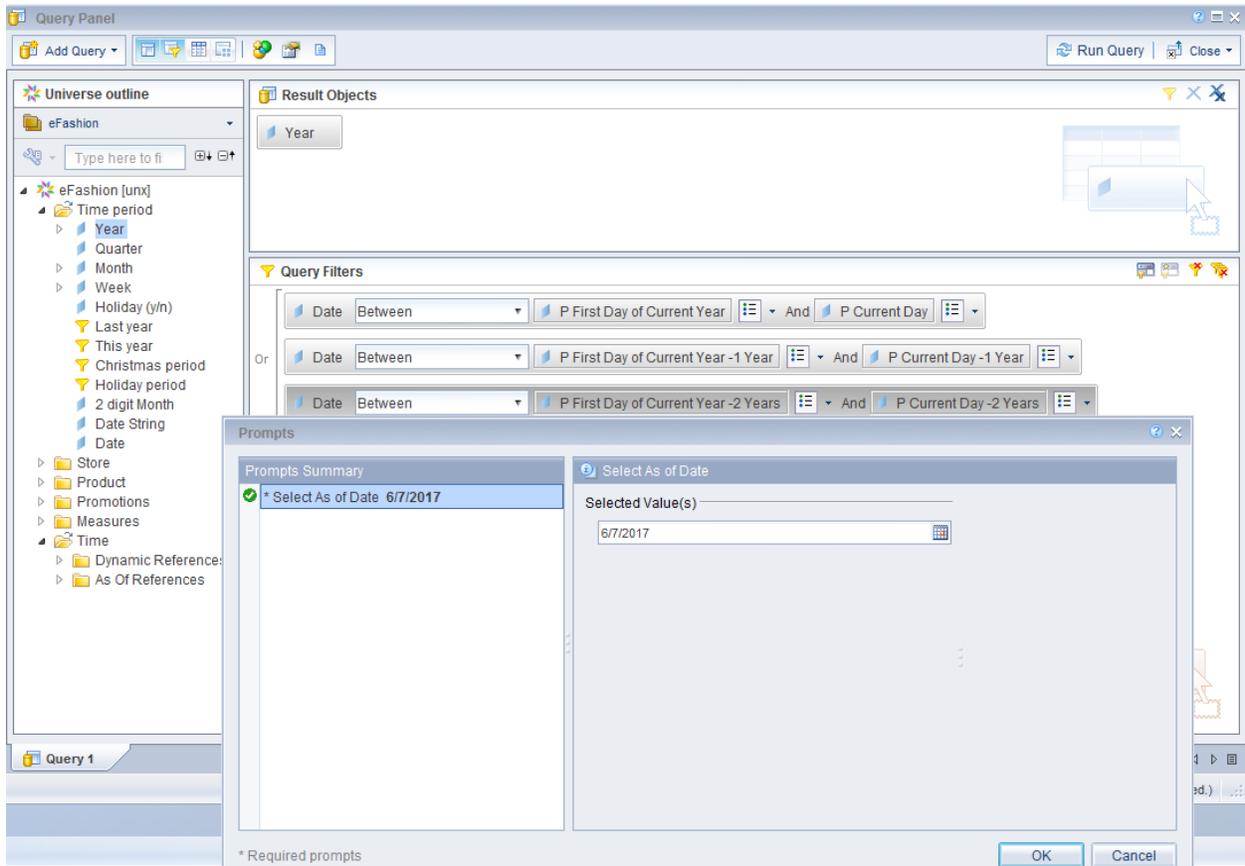
Field Name	MS Access Syntax	SAP HANA Syntax
P Current Day	@Prompt(As of Date)	@Prompt(As of Date)
P Current Day -1 Year	DateAdd('yyyy', -1, @Prompt(As of Date))	Add_Years(@Prompt(As of Date),-1)
P Current Day -2 Years	DateAdd('yyyy', -2, @Prompt(As of Date))	Add_Years(@Prompt(As of Date),-2)
P First Day of Current Year	Format(('01/01' & Year(@Prompt(As of Date))), 'mm/dd/yyyy')	To_Date(To_Char(@Prompt(As of Date), 'YYYY')    '01'    '01')
P First Day of Current Year -1 Year	Format(('01/01' & Year(DateAdd('yyyy', -1, Date()))), 'mm/dd/yyyy')	To_Date(To_Char(Add_Years(@Prompt(As of Date), -1), 'YYYY')    '01'    '01')
P First Day of Current Year -2 Years	Format(('01/01' & Year(DateAdd('yyyy', -2, Date()))), 'mm/dd/yyyy')	To_Date(To_Char(Add_Years(@Prompt(As of Date), -2), 'YYYY')    '01'    '01')

## 7. Setting the Web Intelligence filters

In order to use our new prompt powered references, include them in your between filter just like we did with the dynamic references.



With all of the prompt powered references added, we can add a field to the results objects and run the report.



We are prompted a single time (Web Intelligence will automatically collapse multiple versions of the same prompt) and it is defaulted to today (obviously, we took screen shots on June 7, 2017).

There you have it: two ways to add dynamic dates to your BusinessObjects Web Intelligence report filters. While the dynamic ones shown first are extremely useful, once we created the prompt powered ones, they truly became our default at our client. The amount of flexibility with the prompts coupled with a dynamic default is the best of both worlds.

## 8. But wait, there's more...

Are you still here? "But guys, I want more syntax and options!"

Fine, here's a list of what we used for our client. If it's not here, utilize the date syntax to fit to your need.

Reference	MS Access (T-SQL)	Oracle (PL-SQL)	HANA (SQLScript)
Current Day	Date()	Trunc(sysdate)	Current_Date()
Current Day -1 Week	Date() -7	Trunc(sysdate) -7	Add_Days(Current_Date,-7)
Current Day -1 Month	DateAdd('m', -1, Date())	Add_Months(Trunc(sysdate),-1)	Add_Months(Current_Date,-1)
Current Day -1 Year	DateAdd('yyyy', -1, Date())	Add_Months(Trunc(sysdate),-12)	Add_Years(Current_Date,-1)
First Day of Current Month	Format((Month(Date()) & '/01/' & Year(Date())), 'mm/dd/yyyy')	To_Date('01'    To_Char(Trunc(sysdate), 'mmyyy y'), 'ddmmyyyy')	To_Date(Concat(To_Char(Current_Date, 'YYYYMM'), '01'))
First Day of Current Year	Format(('01/01/' & Year(Date())), 'mm/dd/yyyy')	To_Date('0101'    To_Char(Trunc(sysdate), 'yyyy'), 'ddmmyyyy')	To_Date(Concat(To_Char(Current_Date, 'YYYY'), '0101'), 'YYYYM MDD')
First Day of Current Quarter	iif(DatePart('q', Date()) = '1', Format(('01/01/' & DatePart('yyyy', Date())), 'mm/dd/yyyy'), iif(DatePart('q', Date()) = '2', Format(('04/01/' & DatePart('yyyy', Date())), 'mm/dd/yyyy'), iif(DatePart('q', Date()) = '4', Format(('07/01/' & DatePart('yyyy', Date())), 'mm/dd/yyyy'), iif(DatePart('q', Date()) = '4', Format(('10/01/' & DatePart('yyyy', Date())), 'mm/dd/yyyy'), Date()))))	CASE To_Char(Trunc(sysdate), 'q') WHEN '1' THEN To_Date(to_char(Trunc(sysdate), 'yyyy')    '0101', 'yyyymmdd') WHEN '2' THEN To_Date(to_char(Trunc(sysdate), 'yyyy')    '0401', 'yyyymmdd') WHEN '3' THEN To_Date(to_char(Trunc(sysdate), 'yyyy')    '0701', 'yyyymmdd') WHEN '4' THEN To_Date(to_char(Trunc(sysdate), 'yyyy')    '1001', 'yyyymmdd') END CASE	CASE '0'    Right(Quarter(Current_Date), 1) WHEN '01' THEN To_Date(to_char(YEAR(Current_Date))    '0101') WHEN '02' THEN To_Date(to_char(YEAR(Current_Date))    '0401') WHEN '03' THEN To_Date(to_char(YEAR(Current_Date))    '0701') WHEN '04' THEN To_Date(to_char(YEAR(Current_Date))    '1001') END
Current Year/Week	DatePart('yyyy', Date()) & '/' & DatePart('ww', Date())	To_Char(Trunc(sysdate), 'yyyy')    To_Char(Trunc(sysdate), 'WW')	Left(ISOWeek(Current_Date), 4)    Right(ISOWeek(Current_Date), 2)
Current Month	Right(('0' & DatePart('m', Date())), 2)	To_Char(Trunc(sysdate), 'MM')	Right('00'    Month(To_Char(Current_Date, 'YYYYMM')), 2)
Current Month/Year	Right(('0' & DatePart('m', Date())), 2) & '/' & Year(Date())	To_Char(Trunc(sysdate), 'mm/yy yy')	To_Char(Current_Date, 'MM/YYYY')
Current Quarter	'Q' & DatePart('q', Date())	'Q'    To_Char(Trunc(sysdate), 'q')	'Q'    To_Char(Current_Date, 'q')
Current Quarter/Year	'Q' & DatePart('q', Date()) & '/' & Year(Date())	'Q'    To_Char(Trunc(sysdate), 'q/yyyy')	'Q'    To_Char(Current_Date, 'q/yyyy')
Current Year	Year(Date())	To_Char(Trunc(sysdate), 'yyyy')	To_Char(Current_Date, 'yyyy')
Prompted Current Day	@Prompt(As of Date)	(To_Date(to_Char(To_Date(@Prompt(As of Date)), 'mm/dd/yyyy'), 'mm/dd/yyyy'))	@Prompt(As of Date)



Jason Kehl, Manager - Data Management & Advanced Analytics  
Protiviti  
[Jason.Kehl@protiviti.com](mailto:Jason.Kehl@protiviti.com)

Jason Kehl is a Manager in Protiviti's in Data Management & Advanced Analytics practice. A multi-year veteran of SAP products, he has helped customers move from BEx Queries into HANA powered BusinessObjects, upgrade environments, security and administration, and build various reports and dashboards. Jason is proficient on SAP BW, Business Explorer queries, Web Intelligence, Information Design Tool, Universe Design Tool, Lumira, HANA modeling, BusinessObjects administration, security and upgrades. He has also spoken at numerous ASUG and SAP Insider events.



Russ Cohen, Senior Consultant – Data Management & Advanced Analytics  
Protiviti  
[Russ.Cohen@protiviti.com](mailto:Russ.Cohen@protiviti.com)

Russ Cohen is a senior consultant in Protiviti's Data Management & Advanced Analytics practice with a strong business and technical background in SAP HANA modeling, Design Studio, Lumira, Web Intelligence, and Information Design Tool. Russ is familiar with and has worked on multiple databases including HANA, ECC, BW, as well as OLAP and relational databases. He is skilled in all stages of the development cycle: requirement analysis, design, development, testing, deployment and end user training abilities.