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Tokyo 10<sup>th</sup> of November 16

# Session 5

Monthly bitemporal historicized data management within the new business register application at Statistics Austria



### Why a new BR?



- Maintenance application (HOST-based) was designed 1995, hence a little outdated
- Inflexible environment
  - Annual historiography
    - Of several maintenance operations only the last would show, others would be overwritten
- Wrong picture of Austrian economy

### How to improve the BR?



- JAVA-Application
- Higher flexibility in all respects
- A monthly bitemporal historiography
  - > Business time
  - > System time
- Two possibilities:
  - > Self-programmed solution
  - > DB2-10

# Why self-programmed solution?



Self-Programmed by Stat. AT	DB2-10
Programming started 2008	Went live in Statistics Austria in 2012
Own ID for each maintenance operation	System historiography table, where invalid values are stored
Business time is one month	Business time is one day
major redesign necessary for using the bitemporal historiography of DB2-10	

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#### **Business time**



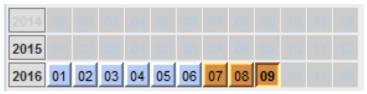
New database entry, valid from January 2016 (until open)

RECHT_ID	KZ_R /	HIST_V	HIST	GUELTIG_VON	GUELTIG_BIS	R_F
183521814	R969D681J	201601	999999	2016-09-02 06:18:08.724	9999-12-31 00:00:00.0	SA

- Entry changed old value still evident
- New database entry IDs

RECHT_ID	KZ_R	HIST VON	HIST	GUELTIG_VON		R_F
183521814	R969D681J	201601	999999	2016-09-02 06:18:08.724	2016-09-02 06:52:27.425	SA
183521855	R969D681J	201601	201606	2016-09-02 06:52:27.425	9999-12-31 00:00:00.0	SA
183521860	R969D681J	201607	999999	2016-09-02 06:52:27.425	9999-12-31 00:00:00.0	LF

Visualization in the application



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## System time 1 – monthly bitemporal



Actual moment of operation

RECHT_ID	KZ_R	HIST_V	HIST	GUELTIG_VON		GUELTIG_BIS	R_F
183521814	R969D681J	201601	999999	2016-09-02 06:18:08.724	)	9999-12-31 00:00:00.0	SA

- ➤ If anything is changed → new database entry
- Old entry set to "No longer valid as of"

RECHT_ID	KZ_R	HIST_VON	HIST	GUELTIG_VON			R_F
183521814	R969D681J	201601	999999	2016-09-02-06:18:08-724	(	2016-09-02 06:52:27.425	SA
183521855	R969D681J	201601	201606	2016-09-02 06:52:27.425	<b>\</b>	9999-12-31 00:00:00.0	SA
183521860	R969D681J	201607	999999	2016-09-02 06:52:27.425		9999-12-31 00:00:00.0	LF

Same maintenance operation leading to two entries due to bitemporal historiography

### System time 2



- Not monthly covered characteristics
  - Unit is part of certain surveys, number of employees, VAT...
- At time of new entry, old one is set to "invalid", and ending time-stamp is set

SM_ID	KZ	GU	ELTIG	GUELTIG_VON	GUELTIG_BIS	SM_ART	SM
63349385	R009X492T	J		2014-08-20 07:15:17.928628	9999-12-31 00:00:00.0	N_AH	AH_IV
45699926	R009X492T	N		2014-03-20 21:03:30.271295	2014-08-20 07:15:17.928628	N_AH	AH_I
	,	<b>、</b> ノ					

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### Business time AND system time?



- Most characteristics are saved monthly bitemporal some are only saved with "system time"-stamps
- New characteristics require discussions with all departments involved

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### Conclusion



- Higher accuracy of the picture Statistics Austria presents of the Austrian economy
- Queries which show the register at a any moment of time

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