YOUPI's Merise Analysis

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Abstract

Merise analysis.

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4 The Relationnal Logical Model Of Data

Here is the relationnal logical model of data used to design the database:

1. Astrophoto Calibration (Astrophoto Id, Astrefcat, XML Path, Flat Field, Output ZP)
2. AstrophotoCalibration-Image Relation (Calibration Id, Astrophoto Id, Image Id)
3. Calibration Kit (Calibration Kit Id, Name, Bad Pix Mask, Flat Field)
4. Cart Item (Item Id, Django's User Id, Processing Kind Id, Name, Data, Date)
5. Channel (Channel Id, Instrument Id, Name, Wave Length, Url, Wave Curve, Trans Curve, Mag Offsets)
6. Coaddition (Coaddition Id, ...)
7. Config File (Config Id, Django's User Id, Processing Kind Id, Name, Content, Data, Date)
8. Final Quality Comment (Final Comment Id, Comment)
9. Final Quality Evaluation (Django's User Id, FITSout Id, Final Comment Id, Date, Grade, Custom Comment)
10. First Quality Comment (First Comment Id, Comment)
11. First Quality Evaluation (Django's User Id, FITSin Id, First Comment Id, Date, Grade, Custom Comment)
12. FITS Tables (Table Id, Name, Instrument, Channel, Run, QSO Status, Object, FITS Table, Absorption, Absorption Err, Is Phot)
13. FITSIn Plugin (FITSIn Id, Processing Task Id, RA offset, Dec offset, RA std dev, Dec std dev, Minimum PSF FWHM, Average PSF FWHM, Maximum PSF FWHM, Minimum PSF half-light diameter, Average PSF half-light diameter, Maximum PSF half-light diameter, Minimum PSF elongation, Average PSF elongation, Maximum PSF elongation, Minimum PSF chi2/d.o.f., Average PSF chi2/d.o.f., Maximum PSF

chi2/d.o.f., Minimum PSF residuals, Average PSF residuals, Maximum PSF residuals, Minimum PSF asymmetry, Average PSF asymmetry, Maximum PSF asymmetry, Minimum number of PSF stars, Average number of PSF stars, Maximum number of PSF stars, Median background, Background RMS, Saturation level, Flat Path, Mask Path, Region Path, QualityFITS Config, Results Ingestion Log, HTTP Url, Previous Release Grade, Previous Release Comment)

14. FITSOut Plugin (FITSOut Id, Processing Task Id)
15. Image (Image Id, Calibration Kit Id, Ingestion Id, Channel Id, Instrument Id, Name, Sky Footprint, Path, Alpha, Delta, Equinox, Object, Date Obs, Exp time, Photc Header, Photc Custom, Photk, Airmass, Absorption, Checksum, Gain, Ingestion Date, Flat, Mask, Reg, QSO Status)
16. Image-Task Relation (I–T Id, Image Id, Processing Task Id)
17. Image Selections (Selection Id, Django's User Id, Name, Data, Date)
18. Ingestion (Ingestion Id, Django's User Id, Label, Start Ingestion Date, End Ingestion Date, Email, Path, Check Fitsverify, Check QSO Status, Check Multiple Ingestion, Exit Code, Report)
19. Instrument (Instrument Id, Name, Telescope, Url, Timezone, Altitude, Nchips, Astrinstru_key, Photinstru_key, Path)
20. Misc Data (Misc Id, Django's User Id, Key, Data, Date)
21. Processing Kind (Processing Kind Id, Internal Name, Label)
22. Processing Task (Processing Task Id, Django's User Id, Processing Kind Id, Start Date, End Date, Success, Error Log, Hostname, Results Output Directory)
23. Run (Run Id, Instrument Id, Name, PI, Url, Email, Process Request Date, Date Start, Date End, Date Download, Release Date)
24. Run-Image Relation (R–I Id, Image Id, Run Id)
25. SCAMP Plugin (SCAMP Id, Processing Task Id, Config, Results Ingestion Log, HTTP Url, LDAC Files, Thumbnails)
26. Survey (Survey Id, Name, Comment, Url)
27. Survey-Instrument Relation (S–I Id, Survey Id, Instrument Id)

Full name	DB field name	Description	Unit	Type	Display Format
Sky footprint	`skyfootprint`	Footprint of image on sky	deg	Multi-polygon	`%8f`
Image name	`name`	Image name (without the `.fits` extansion)	-	string	`%s`
Image path	`path`	Path of image file (cluster or local)	-	string	`%s`
Right ascension	`alpha`	Right ascension of field centre	deg	double	`%02d:%02d:%05.2f`
Declination	`delta`	Declination of field centre	deg	double	`%+02d:%02d:%04.1f`
Equinox	`equinox`	Equinox at time of observation	yr	double	`%7.2f`
Object name	`object`	Object identifiant	-	string	`%s`
Observation date	`dateobs`	Date and time at start of observation	-	datetime	*date %c format*
Exposure time	`exptime`	Effective exposure time	s	double	`%9.2f`
Magnitude zero-point	`photc`	Magnitude Zero-point for 1s exposure	mag	float	`%+8.4f`
Extinction coefficient	`photk`	Extinction coefficient at airmass 1	mag	float	`%7.4f`
Airmass	`airmass`	Airmass at start of observation	-	float	`%8.4f`
Absorption	`absorption`	Absorption at start of observation	mag	float	`%+7.4f`
Checksum	`checksum`	Image file checksum	-	unsigned long long	`%0x`
Gain	`gain`	Detector conversion factor	e-/ADU	vector of floats	`%8.2f`
Ingestion date	`ingestion_date`	Date and time at start of ingestion	-	datetime	*date %c format*
Flatfield	`flat`	Flatfield filename	-	string	`%s`
Mask	`mask`	Mask filename	-	string	`%s`
Ds9 region file	`reg`	Ds9 region filename	-	string	`%s`
Validation flag	`QSOstatus`	Image validation status	-	unsigned char	`%c`

Table 1: Data dictionnary of `Image` entity

Full name	DB field name	Description	Unit	Type	Display Format
RA offset	astoffra	Offset wrt astrometric reference catalogue in RA	arcsec (")	float	%8.3g
Dec offset	astoffde	Offset wrt astrometric reference catalogue in Dec	arcsec (")	float	%8.3g
	astromaccuracy				
RA std dev	aststdevra	Dispersion wrt astrometric reference catalogue in RA	arcsec(")	float	%8.3g
Dec std dev	aststdevde	Dispersion wrt astrometric reference catalogue in Dec	arcsec(")	float	%8.3g
Minimum PSF FWHM	psffwhmmin	Minimum Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Average PSF FWHM	psffwhm	Central/average Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Maximum PSF FWHM	psffwhmmax	Maximum Full-Width at Half-Maximum of the PSF	arcsec(")	float	%8.3g
Minimum PSF half-light diameter	psfhldmin	Minimum half-light diameter of the PSF	arcsec(")	float	%8.3g
Average PSF half-light diameter	psfhldm	Average half-light diameter of the PSF	arcsec(")	float	%8.3g
Maximum PSF half-light diameter	psfhldmax	Maximum half-light diameter of the PSF	arcsec(")	float	%8.3g
Minimum PSF elongation	psfelmin	Minimum elongation of the PSF	-	float	%5.2f
Average PSF elongation	psfel	Central/average elongation of the PSF	-	float	%5.2f
Maximum PSF elongation	psfelmax	Maximum elongation of the PSF	-	float	%5.2f
Minimum PSF chi2/d.o.f.	psfchi2min	Minimum chi2/d.o.f. of the PSF fit	-	float	%7.2g
Average PSF chi2/d.o.f.	psfchi2	Central/average chi2/d.o.f. of the PSF fit	-	float	%7.2g
Maximum PSF chi2/d.o.f.	psfchi2max	Maximum chi2/d.o.f. of the PSF fit	-	float	%7.2g
Minimum PSF residuals	psfresimin	Minimum residuals from the PSF fit	-	float	%7.2g
Average PSF residuals	psfresi	Central/average residuals from the PSF fit	-	float	%7.2g
Maximum PSF residuals	psfresimax	Maximum residuals from the PSF fit	-	float	%7.2g
Minimum PSF asymmetry	psfasymmin	Minimum asymmetry from the PSF fit	-	float	%7.2g
Average PSF asymmetry	psfasym	Central/average asymmetry from the PSF fit	-	float	%7.2g
Maximum PSF asymmetry	psfasymmax	Maximum asymmetry from the PSF fit	-	float	%7.2g
Minimum number of PSF stars	nstarsmin	Minimum number of point-sources per detector used for PSF modeling	-	long int	%d
Average number of PSF stars	nstars	Average number of point-sources per detector used for PSF modeling	-	long int	%d
Maximum number of PSF stars	nstarsmax	Maximum number of point-sources per detector used for PSF modeling	-	long int	%d
Median background	bkg	Median background level	ADU	float	%9.4g
Background RMS	bkgstdev	Dispersion RMS of the background level	ADU	float	%8.3g
Saturation level	satlev	Detector saturation level	ADU	float	%9.4g
Path to mask	mask	Absolute path to mask data	-	string	%s
Path to flat	flat	Absolute path to flat data	-	string	%s
Path to region	reg	Absolute path to region data	-	string	%s
QualityFITS configuration	qfconfig	QF configuration file serialized content (base64 encoding over zlib compression)	-	string	%s
HTTP url	www	URL to QF output HTML data	-	string	%s
Results ingestion log	qflog	Results ingestion log	-	string	%s
Previous quality evaluation	prevrelgrade	Previous QualityFITS-in grading	-	string	%s
Previous quality comment	prevrelcomment	Previous QualityFITS-in comment	-	string	%s

Table 2: Data dictionnary of `FITSin plugin` entity

Full name	DB field name	Description	Unit	Type	Display Format
Results ingestion log	`log`	Results ingestion log	-	string	`%s`
Scamp configuration	`config`	Scamp configuration file serialized content (base64 encoding over zlib compression)	-	string	`%s`
HTTP url	`www`	URL to Scamp output data	-	string	`%s`
LDAC Files	`ldac_files`	List of LDAC files used during processing (serialized data)	-	list	`%s`
Thumbnails	`thumbnails`	True if thumbnails of output images (only group #1) have been created during processing (with convert utility)	-	boolean	`%s`

Table 3: Data dictionnary of `Scamp plugin` entity

DB field name	XML file	Attribute's value
astoffra	scamp.xml	AstromOffset_Reference
astoffde	scamp.xml	AstromOffset_Reference
astromaccuracy	-	-
aststdevra	scamp.xml	AstromSigma_Reference
aststdevde	scamp.xml	AstromSigma_Reference
psffwhmmin	psfex.xml	FWHM_Min
psffwhm	psfex.xml	FWHM_Mean
psffwhmmax	psfex.xml	FWHM_Max
psfhldmin	psfex.xml	-
psfhldm	psfex.xml	-
psfhldmax	psfex.xml	-
psfelmin	psfex.xml	Elongation_Min
psfel	psfex.xml	Elongation_Mean
psfelmax	psfex.xml	Elongation_Max
psfchi2min	psfex.xml	Chi2_Min
psfchi2	psfex.xml	Chi2_Mean
psfchi2max	psfex.xml	Chi2_Max
psfresimin	psfex.xml	Residuals_Min
psfresi	psfex.xml	Residuals_Mean
psfresimax	psfex.xml	Residuals_Max
psfasymmin	psfex.xml	Asymmetry_Min
psfasym	psfex.xml	Asymmetry_Mean
psfasymmax	psfex.xml	Asymmetry_Max
nstarsmin	psfex.xml	NStars_Accepted_Min
nstars	psfex.xml	NStars_Accepted_Mean
nstarsmax	psfex.xml	NStars_Accepted_Max
bkg	accept.xml	Mbkg
bkgstdev	-	-
satlev	swarp.xml	SatLev_Default

Table 4: Table Field - XML Data Mapping

Full name	DB field name	Description	Type	Precision
	astrefcat xmlpath flatfield outputzp			

Table 5: Data dictionnary of Astrophoto calibration entity

Full name	DB field name	Description	Type	Precision
	name badpixelmask flatfield			

Table 6: Data dictionnary of Calibration kit entity

Full name	DB field name	Description	Type	Precision
	name wavelength url wavecurve transcurve magoffsets			

Table 7: Data dictionnary of Channel entity

Full name	DB field name	Description	Type	Precision
	name telescope url timezone altitude nchips astrinstru_key photinstru_key path			

Table 8: Data dictionnary of Instrument entity

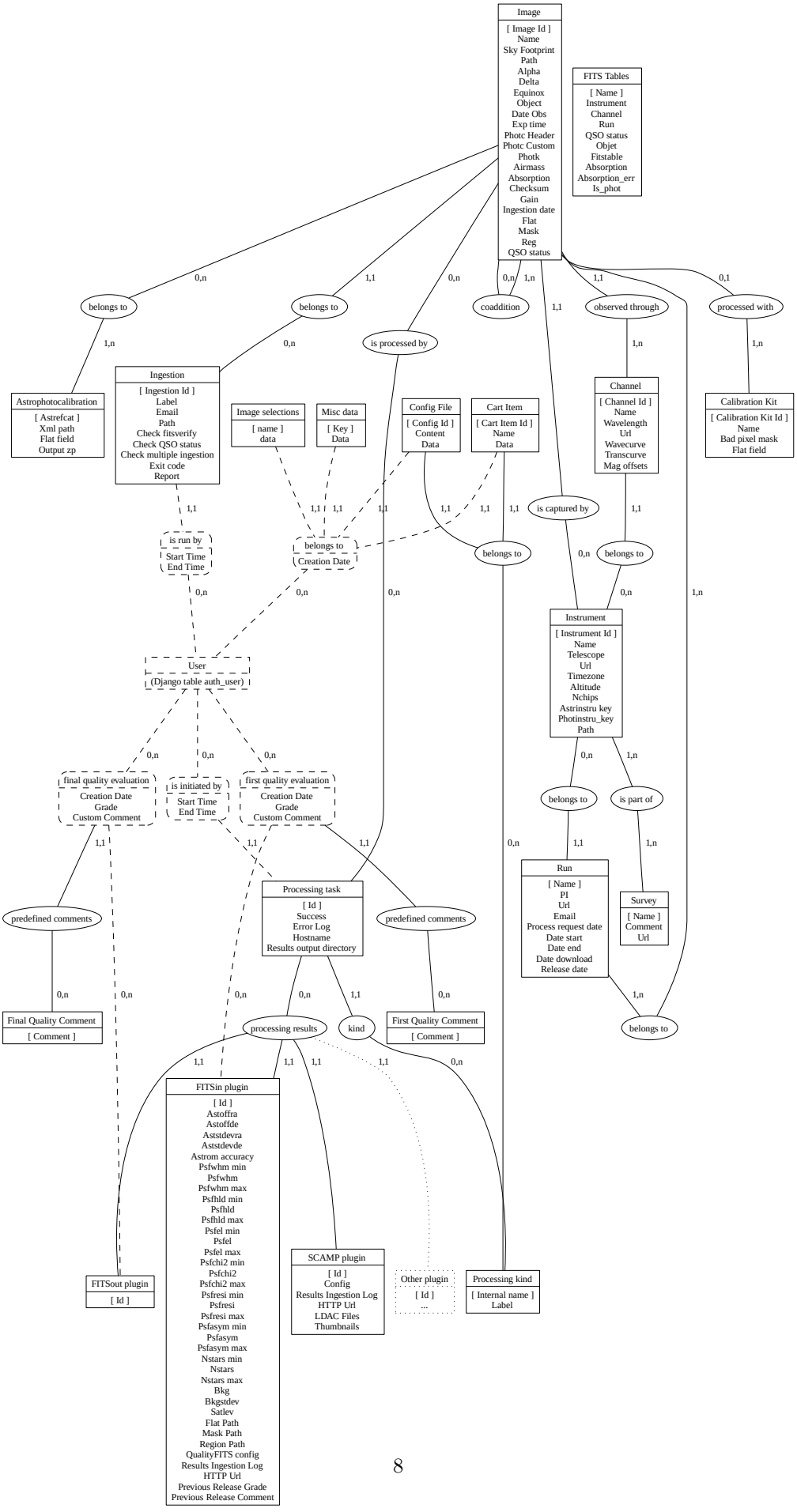

Figure 1: The conceptual model of data (MCD). Properties surrounded with brackets are entities identifiers. The *User* entity (and its relations) is displayed with a dashed style because it is part of the standard Django's database model.

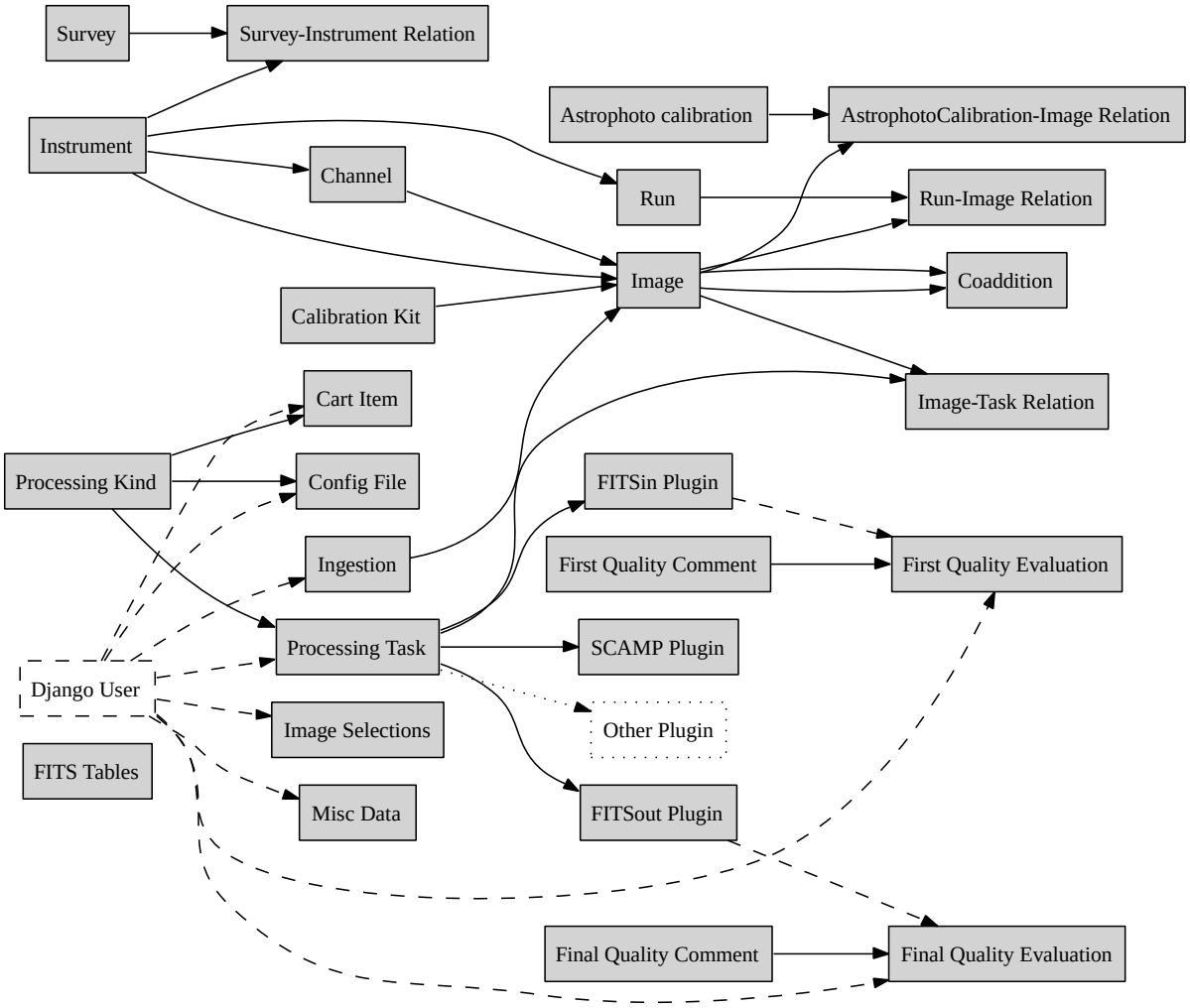

Figure 2: The CODASYL logical model resulting of transformation rules applied to the previous MCD model. The *Django User* record is displayed with a dashed style because it is part of the standard Django's database model.

CODASYL Record name	DB table name	Django's class(model) name
Astrophoto Calibration	youpi_astrophotocalibration	Astrophotocalibration
AstrophotoCalibration-Image Relation	youpi_rel_ai	Rel_ai
Calibration Kit	youpi_calibrationkit	CalibrationKit
Cart Item	youpi_cartitem	CartItem
Channel	youpi_channel	Channel
Coaddition	youpi_coaddition	Coaddition
Config File	youpi_configfile	ConfigFile
Final Quality Comment	youpi_finalqcomment	FinalQComment
Final Quality Evaluation	youpi_finalqeval	FinalQEval
First Quality Comment	youpi_firstqcomment	FirstQComment
First Quality Evaluation	youpi_firstqeval	FirstQEval
FITS Tables	youpi_fitstables	Fitstables
FITSIn Plugin	youpi_plugin_fitsin	Plugin_fitsin
FITSOut Plugin	youpi_plugin_fitsout	Plugin_fitsout
Image	youpi_image	Image
Image-Task Relation	youpi_rel_it	Rel_it
Image Selections	youpi_imageselections	ImageSelections
Ingestion	youpi_ingestion	Ingestion
Instrument	youpi_instrument	Instrument
Misc Data	youpi_miscdata	MiscData
Processing Kind	youpi_processing_kind	Processing_kind
Processing Task	youpi_processing_task	Processing_task
Run	youpi_run	Run
Run-Image Relation	youpi_rel_ri	Rel_ri
SCAMP Plugin	youpi_plugin_scamp	Plugin_scamp
Survey	youpi_survey	Survey
Survey-Instrument Relation	youpi_rel_si	Rel_si

Table 9: Record–Table name mappings