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IBIS-calc , a Dutch Cost Information System

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KEYWORDS

Classification, Computerised calculation, CAD

ABSTRACT

In the last few years a computerised cost-information system has been developed in the Dutch Department of Housing and Public Building, called Integrated Building Information System (IBIS-calc).

This system is based on a hierarchical information-model that answers the need for cost-information of those who are responsible for design, for costs and for project management. As this information-model (and a number of other aspects of the system) are generally applicable it may serve as an example, or prototype, for other information systems.

Summarisation, totalisation and sortation

For project-management and for cost-control it is necessary that the information can be summarised and totalised. (see fig 1,4 and 5)

It is also necessary that information can be sorted. (see fig 2 and 3)

The set of computerprogrammes that has been developed, allow the information and the costs to be summarised and the costs to be totalised in any sortation.

Information-levels

IN IBIS-calc this summarisation, totalisation and sortation can be done at a great number of levels. These levels are identified by a lettercode from A to Z, to keep them apart and to preserve their order. (see fig. 3)

Thus 26 levels of information are available. Although these levels can be freely defined, in practice only a limited number (only 6 to 10) are used.

1. The first and basic level is usually the resource-level. All the resources which are to be used in a project are listed, grouped for instance in subsets for materials, labour, plant and subcontractors.
2. A second level can be the activity-level. All the activities of a certain project, and the resources that are required for each of them, can be defined, calculated, sorted, summarised and totalised into activities.
3. The ultimate level should be the total project which gives the summary and the total for the whole project. Information at this level must



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usually be subdivided into information about parts of the project, buildings, stories, sections, etc. This requires one or more separate levels.

4. Intermediate levels can be the element-level and/or the trade-level. The above mentioned activities can be grouped according to functional elements or according to traditional specification-headings like trades.

Or both, using different levels.

Some examples of the possible use of levels are given in fig 3.

Classification

In the IBIS-calc system any classifications can be used.

Since there are 26 levels available 26 different classifications (or more) can be used.

In the files which have been created SfB-tabel 1 has been used for the functional elements and for the activities and SfB-tabel 3 has been used for the resources.

In Holland there is no generally accepted table for trades, so there is no need for an information-level for trades.

In figure 4 and 5 two examples of print-outs are given from two levels: elements and activities, in this case levels Q and R.

A data-base of activities

An interesting example of the free use of the levels is the data-base which has been developed in the Departement of Housing and Public Building to support the creating and pricing of Bills of Quantities.

In this data-base standard-activities have been defined on one level (V) with the resources they require on the next level(s). These resources are priced, those prices can be easily updated.

By means of a Catalogue of Activities the taking of can be done faster. (see fig. 6)

Each Activity is coded with:

- 1 digit for the layer (in this case V),
- 6 digits for the type of activity (including 2 digits for the element, in this example 21)
- 6 digits for the resources. These last six codes can be looked up in a matrix.

In an adjoining page extra information is given and instructions are given for taking of. Furthermore it gives information on what is deemed to be included and the assumed losses.

Use on micro-computer and relation with CAD

IBIS-calc can be used on any micro-computer with sufficient memory and is the first calculation-package operating with a CAD interface (Intergraph).

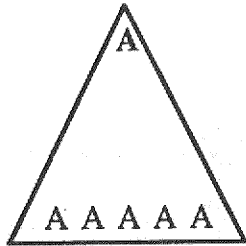


Figure 1. Summarisation
and totalisation

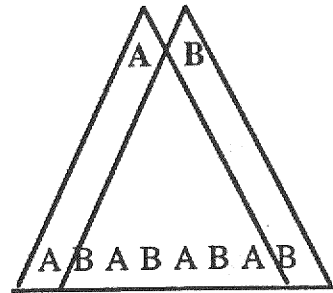


Figure 2. Sortation of information

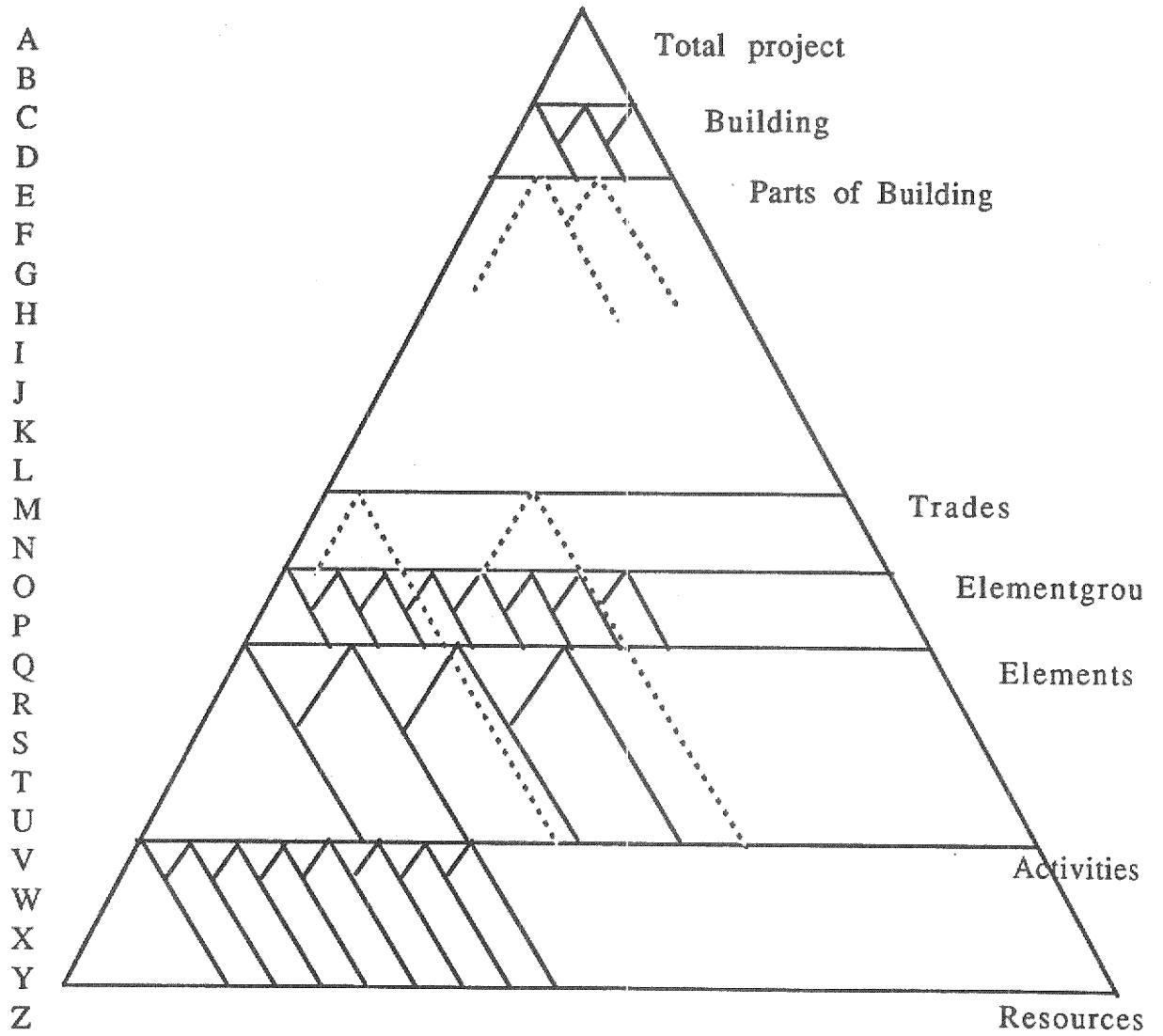


Figure 3. Example of the use of layers for project information

Rijks Gebouwen Dienst Den Haag

Project : GAB(R)
Peildatum: 01-01-86
Overzicht: Analyses

Arbeidsburo te Alkmaar

Printdatum: 29-10-87
Printtijd: 09:22:15
Blad: 3

Kodenummer	Omschrijving	Hoeveelheid Ehd	Norm/Prijs	Totaalprijs
Q-34	/ Leuningen, balustrades	per pst		
R-341	.011212/ Steektrap leuning	16.000 st	756.000	12096.00
R-341	.210212/ Steektrap leuning	2.000 st	1512.000	3024.00
R-341	.010212/ Steektrap leuning	3.000 st	1512.000	4536.00
				+
	Leuningen, balustrades	per pst	totaal	19656.00
Q-42	/ Binnenwand-afwerkingen	per pst		
R-42	.200000/ Wandafwerking muurverf	545.750 m2	10.000	5457.50
R-42	.500000/ Wandafwerking kunststof	1491.000 m2	37.000	55167.00
R-42	.600000/ Wandafwerking tegels	167.000 m2	60.000	10020.00
				+
	Binnenwand-afwerkingen	per pst	totaal	70644.50
Q-43	/ Vloer-afwerkingen	per pst		
R-432	.710000/ Vloerafwerking linoleum	227.000 m2	45.000	10215.00
R-432	.210000/ Vloerafwerking tegels	44.000 m2	65.000	2860.00
R-432	.410000/ Vloerafwerking textiel	952.000 m2	45.000	42840.00
R-432	.310000/ Vloerafwerking natuursteen	301.000 m2	95.000	28595.00
R-432	.010000/ Cementdekvloer	73.500 m2	10.000	735.00
				+
	Vloer-afwerkingen	per pst	totaal	85245.00
Q-45	/ Plafonds	per pst		
R-45	.331000/ Systeemplafond	1403.000 m2	55.000	77165.00
				+
	Plafonds	per pst	totaal	77165.00
Q-47	/ Dak-afwerkingen	per pst		
R-472	.111100/ Beloopbaar dak + isolatie	515.000 m2	91.000	46865.00
R-473	.200000/ Dakrand dakopstand	152.000 m	59.000	8968.00
				+
	Dak-afwerkingen	per pst	totaal	55833.00

Figure 4 Totalisation of activities (R) to elements (Q)

Rijks Gebouwen Dienst Den Haag

Projekt : GAB(R)
Peildatum: 01-01-86

Arbeidsburo te Alkmaar

Printdatum: 29-10-87
Printtijd: 09:21:12

Kodenummer	Omschrijving	Hoeveelheid Ehd	Norm/Prijs	Totaalprijs
Q-0	Project algemeen	1.000 pst	176830.000	176830.00
Q-11	Bodemvoorzieningen (bouwput)	540.000 m2	355.028	191715.00
Q-13	Vloeren op grondslag	535.000 m2	100.000	53500.00
Q-16	Funderingsconstructies	204.000 m2	46.000	9384.00
Q-17	Paalfunderingen	36.000 st	441.000	15876.00
Q-211	Buitenwanden	1345.000 m2	342.937	461250.00
Q-221	Binnenwanden	1000.000 m2	67.803	67803.00
Q-23	Vloeren, galerijen	1032.000 m2	186.000	191952.00
Q-24	Trappen, hellingen	8.000 st	2447.500	19580.00
Q-27	Daken	515.000 m2	196.000	100940.00
Q-28	Constructieve onderdelen	1.000 pst	87459.000	87459.00
Q-31	Buitenwand-openingen	350.000 m2	502.970	176039.50
Q-32	Binnenwand-openingen	95.000 st	407.000	38665.00
Q-34	Leuningen en balustrades	21.000 st	936.000	19656.00
Q-42	Binnenwand-afwerkingen	2204.000 m2	32.053	70644.50
Q-43	Vloerafwerkingen	1600.000 m2	53.278	85245.00
Q-45	Plafonds	1403.000 m2	55.000	77165.00
Q-47	Dak-afwerkingen	515.000 m2	108.414	55833.00
	Bouwkundige werken excl. strt		totaal	1899537.00

Figure 5 Summarisation and totalisation at the element-level

toelichting
V-21 10 20

middelen

- metselen buitenspouwblad
- voegen buiten metselsteen
- stellen en slopen profielen
- monteren/ demonteren schraagsteiger
- baksteen
- kalkzandsteen
- betonsteen
- metselmortel
- voegmortel
- afschrijven profielen
- afschrijven vouwchraag
- beslag beëindiging

inclusief:

- 3% hak- en breukverlies
- 5% mortelverlies

keuzemogelijkheid stenen:

	formaten			
	WF	AF	MF	VF
baksteen	*	*	*	*
kalkzandsteen	*	*	*	*
betonsteen	*	*	*	*

Standaard-waarden maatgegevens

S	T	U	V	W	X	Y
1,00	1,00		0,00	0,00	0,08	

Buitenwanden, buitenspouwblad metselsteen
m2 | st
V-21 10 20

	A	B	C	D	E	F
	steensoort	formaat	wanddikte	uitvoering	veegwerk	beëindiging
0					n.v.t.	n.v.t.
1	baksteen < / 350	waal -	klomp	vull	pijpvol	schone beëindiging
2	baksteen / 350 - / 500	amstel -	halfsteens	schoon	verdiept	rolsaag horizontaal
3	baksteen > / 500	mass -	steens		geknipt	rolsaag schuin
4	kalkzandsteen	vecht -			geborsteld	
5	kalkzandst klinker	rijn -			speciaal	
6	betonsteen					
7						
8						
9						

keuzemogelijkheden - voor formaten : zie toelichting

S	T	U	V	W	X	Y	Z
lengte (m)	hoogte (m)		oppervl opening (m2)	schraagsteiger (m)	profielen aantal (st)		lengte beëindiging (m)

datum 02-04-87

Figure 6 A (double) page from the catalogue of the standard-activities-data-base

