510996

TYPES
Types for Proofs and Programs

Coordination Action
FP6-2002-IST-C

Periodic management report no 3

Period covered: Aug 1, 2006 – Aug 31, 2007

Date of preparation: January 8, 2008

Duration of project: Sept 1, 2004 – April 30, 2008

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Summary

The aim of the research in the Types consortium is to develop the technology of formal reasoning and computer programming based on Type Theory. This is done by improving the languages and computerised tools for reasoning, and by applying the technology in several domains such as analysis of programming languages, certified software, formalisation of mathematics and mathematics education.

The funding for the Types project goes to coordination of and communications between research groups. The research itself is funded by other sources. The Types consortium receives funding for three annual meetings to communicate recent work throughout, six smaller thematic workshops on designated research themes, one summer school, short courses and short visits between sites.

The consortium consists of 35 research groups from universities and industries in Europe. It would have been unfeasible to let each of these groups be full participants in the action. In order to manage this, we have created a two-level hierachy with 15 main sites (the contractors of the project) and 21 subsites (subcontractors). The following are the main sites (contractors): Chalmers, CNRS – Paris 7, INRIA-Futurs, INRIA-Sophia, Paris – Sud, Munich – LMU, Munich – TU, Nijmegen, Bialystok, Royal Holloway, Edinburgh, Manchester, Torino, Udine, Warsaw, Tallinn. The small sites (subcontractors) are: Bergen, Helsinki, Stockholm/Uppsala, Minho, Padova, Bologna, Dassault-Aviation, Grenoble, France Telecom, Kent, Novi Sad, Krakow, Savoie, Swansea, Toulouse, Birmingham, Nottingham and Sheffield.

1 Redistribution of money among the sites

After the first two periods of the project (in August 2006) we discovered that we had around 150 000 euros which had not been spent by the project. This is around one third of the expected expenses. We discussed this among the sites and saw an opportunity to organize another summer school and a number of small workshops. The original plan was to have one summer school during the three years, but there was definitely a need for another one. The small workshops were also very important and there was a need for more of them.

Analyzing the spending of the different sites (together with some crude estimate of "activity" in the project) we agreed to redistribute the money for the last period of the project. Of the around 150 000 euros to redistribute we decided to use around 50 000 euros for the new summer school and the new workshops. The remaining around 100 000 euros was then distributed to the seven most active sites: Chalmers, Paris 7, Nijmegen, Royal Holloway, Edinburgh, Tallinn and Munich LMU. This was in principle done in proportion to $(2 + n)$, where n is the number of subsites. Nijmegen, which was a very active site recieved an extra sum.

Here follows a more detailed description of the calculation:

We have 147 830 euros to distribute. We divide this into 48 164 euros for the new summer school and the small workshops and 99 666 to the seven most active sites.

In table 1 we can see the calculation of the cost for courses and in table 2

we see the distribution of the extra money over the seven sites. Finally, in table 3 we have added this amount to the original amounts for each site, showing the new distribution of the money.

activity	nr of events	nr of speakers	ind cost	event cost
short courses	2	1	1 833	3 666
summer school	1		33 500	33 500
small workshop	6	1	1 833	10 998
sum for courses etc:				48 164

Table 1: Cost for courses etc.

Chalmers	21 818
Paris 7	13 091
Nijmegen	13 091
Royal Holloway	30 545
Edinburgh	8 727
Tallinn	8 727
Munich LMU	3 667
sum:	99 666

Table 2: Distribution of extra money

		Previous plan (1)	addition	total
1 Chalmers				
site spec		18 200	21 818	40 018
Coordination		4 500		4 500
	school		33 500	33 500
	workshops	4 400	10 998	15 398
	short courses		3 666	3 666
	types meeting	7 200		7 200
2 Paris 7		10 920	13 091	24 011
3 INRIA		25 480		25 480
4 UPS		14 560		14 560
5 LMU		7 280	3 677	10 957
6 TUM		10 920		10 920
7 KUN		7 280	13 091	20 371
8 Bialystok		7 280		7 280
9 Royal Holloway		25 480	30 545	56 025
10 Edinburgh		7 280	8 727	16 007
11 Manchester		10 920		10 920
12 Torino		10 920		10 920
13 Udine		10 920		10 920
14 Warsaw		10 920		10 920
15 Tallinn		6 106	8 727	14 833
Total		200 566	147 840	348 406

Table 3: Total distribution

2 Activity

During the year we organized the annual Types conference with more than 100 participants. We also organized 6 small workshops with around 25 participants each. Thanks to a redistribution of money among the sites we could also organize a summer school with around 80 students. There were 89 individual visits between the sites. A more detailed description of this is found in the periodic activity report no 2.

We have been asked to give a distribution of the different activities between the sites. This is summarized in the table on page 6. Such a table can only be a crude estimate, and – as is always the case with numbers – says very little about the true effort and quality in the activity.

We have reached the numbers in the column for person-months in the following way: An estimate of the "activity" involved in the Types meeting is one week for a normal participant and 5 weeks for a speaker. To organize a small conference is estimated to take 4 weeks, to organize the Types meeting 10 weeks, to organize the summer school 14 weeks, to host a talk three weeks, and to give a talk three weeks of work. The figure for the planned activity is taken from page 37 in Annex I of the project proposal, it is obtained by taking one third of the figures for total activities (excluding management activities).

During this period, *most sites have been around three times more active in the Types project as was planned* in Annex I, the Description of work. There are many reasons for this: the summer school was not planned, neither the workshops organized this year.

Table 4: Summary of activities in the Types project

	Activity				Workshops			Types meeting			Lectures	
	planned months	actual months	actual months	days	participants	speakers	organized	participants	speakers	organized	hosted	given
Chalmers	14	41	29	675	17	7	0	6	2		12	5
Bergen			5	115	1	0	0	1			5	2
Helsinki			1	25	0	0	0				1	0
Stockholm			5	120	5	2	0				1	2
CNRS/Université Paris 7	11	17	13	290	13	0	3	2			9	0
Savoie			5	105	3	2	0	1	1		0	0
INRIA-Futurs	24	80	45	1035	43	18	2	9	7		4	0
INRIA-Sophia			15	345	11	4	0	5	1		3	1
Bologna			15	335	9	3	1	4	1		0	0
Dassault-Aviation			0	0	0	0	0				0	0
Minho			5	115	1	1	0	1	1		1	2
Université Paris Sud	14	19	19	435	15	4	0	3	2		5	0
Grenoble			0	0	0	0	0				0	0
France Telecom			0	5	1	0	0				0	0
LMU München	8	18	18	425	8	4	0	3	2		5	7
TU München	11	26	24	555	10	7	0	4	4		5	3
Bamberg			2	40	0	0	0				2	0
Nijmegen	9	32	32	725	26	9	2	4	2		7	7
Bialystok	8	5	5	115	4	2	0	1			0	0
Royal Holloway	22	60	8	190	6	2	0	4	1		3	0
Birmingham			6	140	5	2	0	1			0	4
Kent			0	10	0	0	0				0	0
Nottingham			33	770	18	12	0	6	5		6	5
Sheffield			2	35	2	0	0	2			0	1
Toulouse			10	235	5	2	0	2	1		0	7
Edinburgh	9	29	29	670	22	10	1	8	4		1	7
Manchester	11	18	7	160	7	3	0	2	1		0	1
Swansea			11	245	2	1	0	2	1		2	9
Torino	11	19	14	330	6	1	0	2	1		0	12
Novi Sad			5	110	1	1	0	1	1		0	2
Udine	11	35	22	515	8	2	3	7	2	3	4	4
Padova			12	280	14	3	1				5	0
Warsaw	11	18	15	345	10	4	0	5	3		2	3
Krakow			3	60	1	1	0	1	1		0	0
IoC Tallinn	3	12	12	275	3	2	0	2	1		6	5
External sites					190	50		20	4			
Total	177	427	427		467	159		109	49		89	89

2.1 Workshops

The workshop activity is summarized in table 5.

	Workshops			Education			HOR			Chit/Chat			Math Wiki			TPR			Topology			Inference			Huet		
	participants	speakers	organized	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by	participants	speakers	organized by
Chalmers	17	7	0							2	2		1	1					1	1					2	1	
Bergen	1	0	0																								
Helsinki	0	0	0																								
Stockholm	5	2	0																3	2							
CNRS/Université Paris 7	13	0	3				4		1													5		1	2		
Savoie	3	2	0	1	1																						
INRIA-Futurs	43	18	2				3	1		5	3			1		3	1					6	3		9		1
INRIA-Sophia	11	4	0	1	1		1			1				1												1	
Bologna	9	3	1		1					1	1								2								
Dassault-Aviation	0	0	0																								
Minho	1	1	0																								
Université Paris Sud	15	4	0	1			1			1						2									7		
Grenoble	0	0	0																								
France Telecom	1	0	0																						1		
LMU München	8	4	0					1		1	1								2								
TU München	10	7	0							2	2		1	1													
Bamberg	0	0	0																								
Nijmegen	26	9	2		1	1				9	4	1	4	1					2	1							
Bialystok	4	2	0		1								1	1													
Royal Holloway	6	2	0	1										1													
Birmingham	5	2	0																2	2							
Kent	0	0	0																								
Nottingham	18	12	0							5	3			2		2											
Sheffield	2	0	0																								
Toulouse	5	2	0				2	1																			
Edinburgh	22	10	1							3	2		2	1	1				1						2	3	
Manchester	7	3	0																3	2							
Swansea	2	1	0																								
Torino	6	1	0	2			2																				
Novi Sad	1	1	0																								
Udine	8	2	3																1								
Padova	14	3	1																11	3	1						
Warsaw	10	4	0	2	1		1						1														
Krakow	1	1	0																								
IoC Tallinn	3	2	0					1																			
External sites	190	50		1	3		15	4		5	3		5	4		7	0		23	9		15	8		60	8	
Total	467	159		9	9		29	8		35	21		15	14					51	20		26	11		83	13	

Table 5: Small workshops in the Types project

2.2 Visits between sites

The progress report contains a summary of the scientific content of the individual visits between the sites. In table 6 we present a matrix showing how people have visited other groups.

		To:																																						
From:		Chalmers	Bergen	Helsinki	Stockholm	Paris 7	Savoie	INRIA Futurs	Sophia	Bologna	Dassault	Minho	Paris Sud	Grenoble	France Tele	LMU	TUM	Bamberg	Nijmegen	Bialystok	Holloway	Birmingham	Kent	Nottingham	Sheffield	Toulouse	Edinburgh	Manchester	Swansea	Torino	Novi Sad	Udine	Padova	Warsaw	Krakow	Tallinn	Total
Chalmers																			1					4														5
	Bergen							1					1																										2
	Helsinki																																						0
	Stockholm																																1			1		2
CNRS/Paris 7																																							0
	Savoie																																						0
INRIA-Futurs																																							0
	INRIA-Sophia	1																																					1
	Bologna																																						0
	Dassault-Aviation																																						0
	Minho																																					2	2
Paris Sud																																							0
	Grenoble																																						0
	France Telecom																																						0
LMU München			3																	2								1		1								7
																																							0
TU München								1					1																	1								3
	Bamberg																																						0
Nijmegen			3					1	1								1																				1	7
Bialystok																																							0
Royal Holloway																																							0
	Birmingham																	1																3				4
	Kent																																						0
	Nottingham		2					1					1																								1	5
	Sheffield																	1																				1
	Toulouse		1		1	1	1					1				1					1																	7
Edinburgh			1						2								3		1																			7
Manchester																1																							1
	Swansea			3												3	1				1			1														9
Torino						8															1													1		2		12
	Novi Sad																																	2				2
Udine				2																														1			1	4
	Padova																																						0
Warsaw			1										2																									3
	Krakow																																						0
Tallinn																			3					1									1				5
Total		12	5	1	1	9	0	4	3	0	0	1	5	0	0	5	5	2	7	0	3	0	0	6	0	0	1	0	2	0	0	4	5	2	0	6	89

Table 6: Individual visits in the Types project

3 Form C Financial statement per activity for the contractual reporting period

There will be a report of this in the end of the project. Due to the prolongation of the project it was agreed that no Form C's were to be handed in now.

4 Summary financial report

In average the sites have spent around 80 % of the allocated money. The preliminary financial outcome, which can be seen in table 7 shows that there is an uneven distribution of costs. The figures for INRIA are incorrect due to some internal mistake, they are being corrected. The remaining negative figures (Warsaw and Torino) can be explained by their very late understanding of the consequences of the previous budget redistribution.

We are currently renegotiating the money allocated to the different sites, so that the allocation better represents the activity of the various groups. Most of this reallocation will go to the next Types meeting.

Cost Budget Follow-up, Types project September 1, 2004 - August 31, 2007

Site	Expenditu	Budget					Actual expenses			Expenses	Remaining	
		Year 1, prel	Year 1, final	Year 2	Year 3	Year 1-3	Year 1	Year 2	Year 3	Total	Exp/Budget	
Chalmers	Management	43 667	5 958	9 667	8 333	23 958	5 958	4 739	4 949	15 646		
	Coordination	22 667	10 956	18 917	78 568	108 441	10 956	57 864	24 828	93 648		
	Indirect cost	13 267	3 383	5 717	17 380	26 480	3 383	12 521	5 955	21 859		
	total cost	**79 600**	**20 297**	**34 301**	**104 281**	158 879	**20 297**	**75 123**	**35 732**	131 152	**83%**	**27 727**
Paris 7	Coordination	9 100	4 395	9 100	20 009	33 504	4 395	7 745	10 191	22 332		
	Indirect cost	1 820	879	1 820	4 002	6 701	879	1 549	2 038	4 466		
	Adjustment to prev period					0		3 728	1 439	5 167		
	total cost	**10 920**	**5 274**	10 920	24 011	40 205	**5 274**	**13 023**	**13 668**	31 965	**80%**	**8 240**
INRIA	Coordination	21 233	4 440	21 233	21 233	46 907	4 440	16 592	41 870	62 902		
	Indirect cost	4 247	888	4 247	4 247	9 381	888	3 318	8 374	12 580		
	Adjustment to prev period					0		5 385	12 519	17 904		
	total cost	**25 480**	**5 328**	25 480	25 480	56 288	**5 328**	**25 295**	**62 763**	93 386	**166%**	**-37 098**
Paris Sud	Coordination	12 133	7 341	12 133	12 133	31 608	7 341	5 084	9 131	21 556		
	Indirect cost	2 427	1 468	2 427	2 427	6 322	1 468	1 017	1 826	4 311		
	total cost	**14 560**	**8 809**	14 560	14 560	37 929	**8 809**	**6 101**	**10 958**	25 868	**68%**	**12 062**
LMU München	Coordination	6 067	1 166	6 067	9 131	16 363	1 166	1 848	6 387	9 400		
	Indirect cost	1 213	233	1 213	1 826	3 273	233	370	1 277	1 880		
	total cost	**7 280**	**1 399**	7 280	10 957	19 636	**1 399**	**2 217**	**7 664**	11 280	**57%**	**8 356**
TU München	Coordination	9 100	3 937	9 100	9 100	22 137	3 937	4 311	5 461	13 708		
	Indirect cost	1 820	787	1 820	1 820	4 427	787	862	1 092	2 742		
	total cost	**10 920**	**4 724**	10 920	10 920	26 564	**4 724**	**5 173**	**6 553**	16 450	**62%**	**10 114**
Nijmegen	Coordination	6 067	8 445	6 067	16 976	31 488	8 445	11 435	10 865	30 745		
	Indirect cost	1 213	1 689	1 213	3 395	6 298	1 689	2 287	2 173	6 149		
	Adjustment to prev period					0			-1 429	- 1 429		
	total cost	**7 280**	**10 134**	7 280	20 371	37 785	**10 134**	**13 722**	**11 609**	35 465	**94%**	**2 320**
Bialystok	Coordination	6 067	6 842	6 067	6 067	18 975	6 842	4 065	1 405	12 312		
	Indirect cost	1 213	1 368	1 213	1 213	3 795	1 368	813	281	2 462		
	total cost	**7 280**	**8 210**	7 280	7 280	22 770	**8 210**	**4 878**	**1 686**	14 774	**65%**	**7 996**
Royal Holloway	Coordination	21 233	12 329	21 233	46 688	80 250	12 329	16 562	16 968	45 859		
	Indirect cost	4 247	2 466	4 247	9 338	16 050	2 466	3 312	3 394	9 172		
	total cost	**25 480**	**14 795**	25 480	56 025	96 300	**14 795**	**19 875**	**20 361**	55 031	**57%**	**41 269**
Edinburgh	Coordination	6 067	4 660	6 067	13 339	24 066	4 660	6 923	12 082	23 666		
	Indirect cost	1 213	932	1 213	2 668	4 813	932	1 385	2 416	4 733		
	total cost	**7 280**	**5 592**	7 280	16 007	28 879	**5 592**	**8 308**	**14 499**	28 399	**98%**	**480**
Manchester	Coordination	9 100	4 047	9 100	9 100	22 247	4 047	427	3 192	7 666		
	Indirect cost	1 820	809	1 820	1 820	4 449	809	85	638	1 533		
	Subcontracting					0		6 252	4 723	10 975		
	total cost	**10 920**	**4 856**	10 920	10 920	26 696	**4 856**	**6 765**	**8 553**	20 174	**76%**	**6 522**
Torino	Coordination	9 100	5 349	9 100	9 100	23 549	5 349	5 376	16 537	27 262		
	Indirect cost	1 820	1 070	1 820	1 820	4 710	1 070	1 075	3 307	5 452		
	Adjustment to prev period					0			-38	- 38		
	total cost	**10 920**	**6 419**	10 920	10 920	28 259	**6 419**	**6 451**	**19 806**	32 676	**116%**	**-4 417**
Udine	Coordination	9 100	7 719	9 100	9 100	25 919	7 719	6 053	9 101	22 874		
	Indirect cost	1 820	1 544	1 820	1 820	5 184	1 544	1 211	1 820	4 575		
	total cost	**10 920**	**9 263**	10 920	10 920	31 103	**9 263**	**7 264**	**10 922**	27 449	**88%**	**3 655**
Warsaw	Coordination	9 100	-	9 100	9 100	18 200	-	8 754	18 429	27 183		
	Indirect cost	1 820	-	1 820	1 820	3 640	-	1 751	3 686	5 437		
	total cost	**10 920**	**-**	10 920	10 920	21 840	**-**	**10 505**	**22 115**	32 620	**149%**	**-10 780**
IoC Tallinn	Coordination	5 088	3 991	5 088	12 361	21 440	3 991	2 269	10 893	17 152		
	Indirect cost	1 018	798	1 018	2 472	4 288	798	454	2 179	3 430		
	total cost	**6 106**	**4 789**	6 106	14 833	25 728	**4 789**	**2 722**	**13 071**	20 582	**80%**	**5 146**
Total		245 866	109 889	200 567	348 405	658 861	109 889	207 421	259 960	577 271	**88%**	**81 590**

Table 7: Follow-up of costs and budget

5 Justification of major cost items and resources

The character of the Types project (only supporting trips and lectures) is to have no major cost items