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http://www.bioasq.org

## **Challenge Evaluation Report**

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## **Executive Summary**

This deliverable evaluates the first cycle of the BIOASQ challenge both quantitatively and qualitatively. The evaluation was conducted by measuring the number of participants both in the challenge and the workshop, the number of visitors in our websites, and the downloads of the benchmark data. We also used questionnaires distributed to the participants of the challenge and the workshop and to the team of biomedical experts. The analysis showed that we managed to successfully organize the first cycle of the challenge. The participation was satisfactory, especially in Task 1A, and most of the participants are not only willing to participate in the second cycle of BIOASQ, but they also intend to recommend it to other research groups. We also managed to organize a successful workshop leaving a good overall impression to the participants. Finally, we had a very good cooperation with the team of biomedical experts, providing them with all the help and tools they needed for the creation of the benchmark datasets for Task 1B and the evaluation of the systems' responses, again for Task 1B.



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## Introduction

This deliverable evaluates the first cycle of the BIOASQ challenge. For that purpose we provide figures measuring the number of the participants both in the challenge and the workshop, the visitors in our websites, and the downloads of the benchmark data. We also distributed questionnaires to the participants of the challenge and the workshop, as well as to the team of biomedical experts. The questionnaires aimed to assess the quality, appropriateness, and diversity of the challenge benchmarks and evaluation measures, the quality of the support to the participants, and the adequacy and quality of the challenge evaluation infrastructure.

Chapters 2 and 3 below present the evaluation of the first cycle of the BIOASQ challenge based on web statistics and questionnaires respectively. Finally, Appendix A presents the questionnaires used for the qualitative evaluation of BIOASQ.



## Evaluation via web-site statistics and workshop participation

One of the most important features for a successful challenge is attracting participants. Table 2.1 summarizes the most important statistics concerning the evaluation of the challenge. In more detail, we had 117 users registered on the evaluation platform. Moreover, several teams around the globe participated in the first cycle of the BIOASQ challenge, especially in Task 1A, including key players, like Mayo Clinic, NLM, and Toyota Technological Institute. Table 2.2 lists the participating teams of the first cycle of the BIOASQ challenge. We have also organized a successful Workshop following CLEF 2013 as a post event in Valencia, with 30 participants and important invited speakers.

Another important objective of the challenge is to establish BIOASQ as a reference point for the biomedical community. A look at the statistics from our websites indicates that we are moving towards the right direction. Figures 2.1 and 2.2 show that even after the end of the challenge there was high traffic on our websites indicating the community's interest in BIOASQ. In addition, Task 1A continued to run in a "non-challenge" mode helping towards that direction. Table 2.3 shows the numbers of downloads for the datasets of Tasks 1A and 1B.

<sup>&</sup>lt;sup>2</sup>Consult http://www.clef2013.org/ for information on CLEF 2013. For more details about the BioASQ workshop, visit http://www.bioasq.org/workshop.

Registered users	117
Datasets downloads	697
Teams	11
Workshop participants	30
Number of biomedical experts	10

Table 2.1: Summary of the challenge statistics.



http://bioasq.lip6.fr/

Task 1A participation (46 systems, 11 teams)					
Mayo Clinic	USA				
University of Alberta	CANADA				
Aristotle University of Thessaloniki + Atypon	GREECE				
University of Vigo	SPAIN				
University of Colorado	USA				
NCBI, NLM	USA				
Universite de Rouen	FRANCE				
Fudan University	CHINA				
UCSD	USA				
Toyota Technological Institute	JAPAN				
Imran	PAKISTAN				
Task 1B participation					
Phase A (4 systems, 2 teams)					
Mayo Clinic	USA				
University of Alberta	CANADA				
Phase B (7 systems, 2 teams)					
University of Alberta	CANADA				
Toyota Technological Institute	JAPAN				

Table 2.2: Teams participating in both tasks of the first cycle of BIOASQ challenge.

	Dataset downloads					
Task 1A 584 (including 78 after the end of the challenge)						
Task 1B	113					

Table 2.3: Tasks 1A and 1B dataset downloads.

# bioasq.org Unique Visitors 1200 1000 800 400 200 Nov 12 Dec 12 Jan 13 Feb 13 Mar 13 Apr 13 May 13 Jun 13 Jul 13 Aug 13 Sep 13 Oct 13 Nov 13

Figure 2.1: Unique visitors at BIOASQ official site from November '12 until November '13.

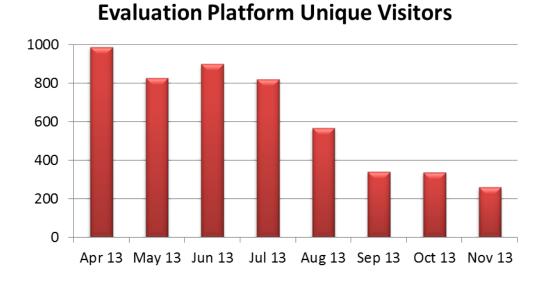


Figure 2.2: Unique visitors at the evaluation platform from April '13 until November '13.

## Evaluation via questionnaires

Having evaluated BIOASQ via web-site statistics, we move on to the results collected via questionnaires. We created and distributed questionnaires to the workshop participants, the participating teams of the challenge, and the team of biomedical experts. The questionnaires aim, among other goals, to assess the quality, appropriateness, and diversity of the challenge benchmarks and evaluation measures, the quality of the support to the participants, and the tools and the support provided to the team of biomedical experts for the creation of the benchmarks. For a more detailed view of the questionnaires see Appendix A.

#### 3.1 Challenge evaluation

The questionnaire distributed to the teams participating in the first cycle of BIOASQ included questions targeting several aspects of the individual tasks, like the quality of the datasets, the technical support etc. Additionally, more general questions were provided to capture the overall impression of the participants for BIOASQ. Figures 3.1–3.3 summarize the results for the most general questions. According to these figures the participants are in general satisfied with the challenge and as a consequence, not only are they willing to participate in the next cycle of the challenge, but they are willing to recommend BIOASQ to other research groups as well. However, there were some difficulties in the general understanding of the challenge as indicated by Figure 3.4. To alleviate this problem we modified the guidelines of the challenge for both tasks in order to make them clearer for the potential participants. Another problem we had to face was the rather small participation in Task 1b. For that we came up with two strategies. The first one was to identify all the research areas that relate to BIOASQ and modify the first page of our official website to include this information. The second one was to create a list of potential participants and invite them, through personal contact, to participate in the challenge.

#### 3.2 Workshop evaluation

Figures 3.5 - 3.9 summarize the statistics collected by the questionnaires distributed to the participants of the workshop. Overall, the participants were satisfied with the different aspects (scientific presentations,



0%

0%

22%

11%

67%

2

1

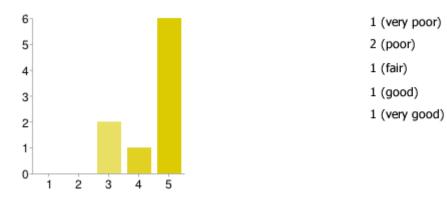


Figure 3.1: Overall impression for BIOASQ by the participating teams.

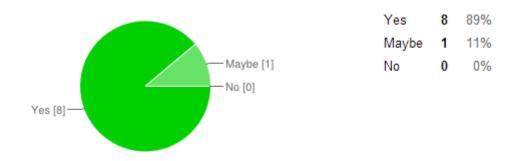


Figure 3.2: Willingness to participate in the second cycle of BIOASQ by the participating teams of the first cycle.

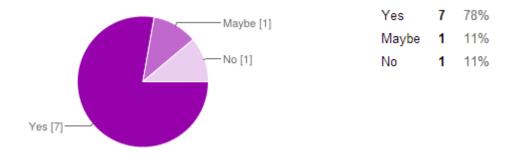
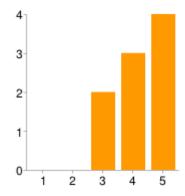
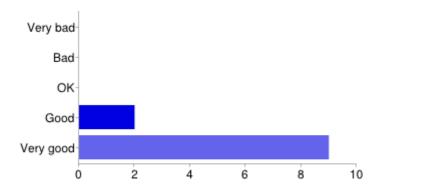


Figure 3.3: Willingness to recommend BIOASQ by the participating teams of the first cycle.



1 (very difficult)	0	0%
2 (difficult)	0	0%
1 (fair)	2	22%
1 (easy)	3	33%
1 (very easy)	4	44%

Figure 3.4: Difficulty to understand BIOASQ tasks.



Very bad 0 0%
Bad 0 0%
OK 0 0%
Good 2 18%
Very good 9 82%

Figure 3.5: Assessment of the presentation of BIOASQ at the workshop.

invited speakers, etc.) of the workshop. Apart from that, even though half of the workshop participants did not participate in the first cycle of BIOASQ, almost all of them are showing a tendency to participate in the second cycle.

#### 3.3 Interaction with the team of biomedical experts evaluation

One of the most difficult goals of BIOASQ was the creation of the benchmark data for Task 1B. For that purpose we had to coordinate a team of biomedical experts and provide them with tools and technical support that would help them in the creation of the benchmarks. In addition, the team of biomedical experts manually assessed the responses of the participating teams in Task 1B, again with the assistance of a tool. After the end of the first cycle of the challenge, we distributed questionnaires to the biomedical experts, in order to assess the quality of the tools and their interaction with us. Figures 3.10 – 3.17 show that we had a very good cooperation with the team of biomedical experts. The experts were not only satisfied by the tools, but they are also willing to use them again in the future and even recommend them to others. Particularly for the annotation tool they are willing to use it for their own work, especially if it is improved. One of the improvements to be made is the saving procedure since, according to the questionnaires, this was the most problematic feature (Figure 3.18). Another issue raised was the search for concepts and RDF triples (Figures 3.19 and 3.20). Taking into consideration all the issues raised by the team of biomedical experts we made all the necessary improvements to the annotation tool to make the creation of the second cycle benchmarks as smooth as possible.



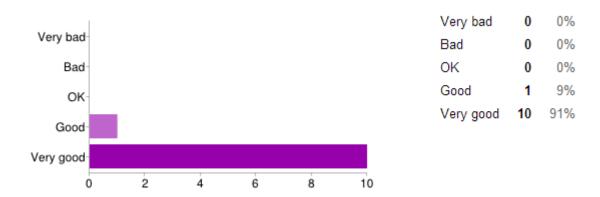


Figure 3.6: Assesment of the invited talks at the workshop.

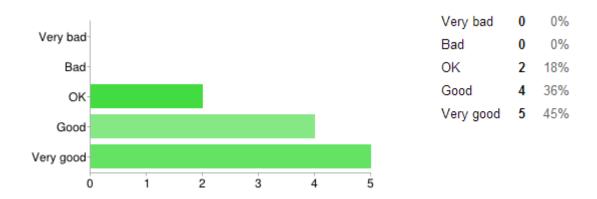


Figure 3.7: Assessment of the scientific presentations at the workshop.



Figure 3.8: Percentage of participation of the workshop participants in the challenge.



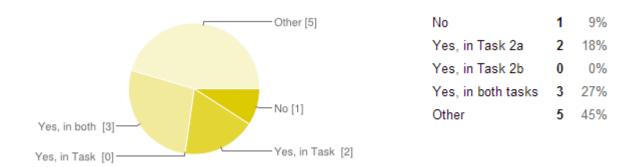


Figure 3.9: Willingness to participate in the second cycle of BIOASQ by the participants of the workshop.

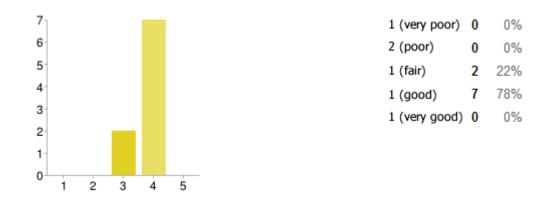


Figure 3.10: Overall impression for the annotation tool by the team of biomedical experts.

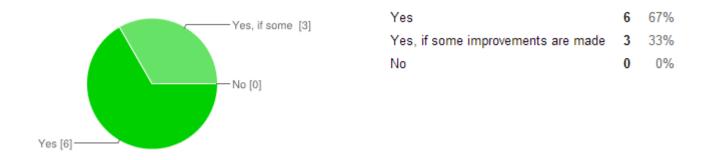


Figure 3.11: Willingness of the team of biomedical experts to use the annotation tool again.

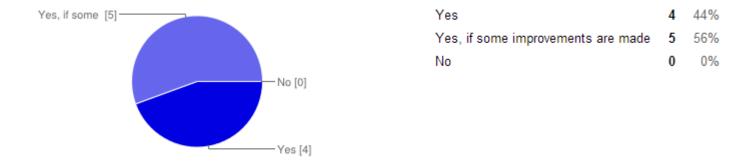


Figure 3.12: Willingness of the team of biomedical experts to use the annotation tool for their work (e.g., to organize a search).

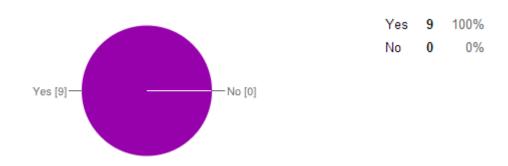
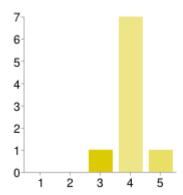


Figure 3.13: Willingness of the team of biomedical experts to recommend the annotation tool.

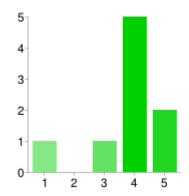


Figure 3.14: Overall impression for the assessment tool by the team of biomedical experts.



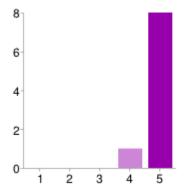
1 (very poor)	0	0%
2 (poor)	0	0%
1 (fair)	1	11%
1 (good)	7	78%
1 (very good)	1	11%

Figure 3.15: Willingness of the team of biomedical experts to use the assessment tool again.



```
1 (very poor) 1 11%
2 (poor) 0 0%
1 (fair) 1 11%
1 (good) 5 56%
1 (very good) 2 22%
```

Figure 3.16: Willingness of the team of biomedical experts to recommend the assessment tool.



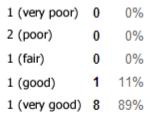
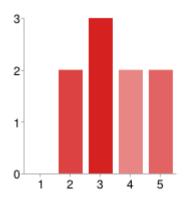


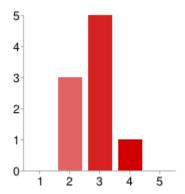
Figure 3.17: Assessment of the interaction of the team of biomedical experts with us.





1 (very poor)	0	0%
2 (poor)	2	22%
1 (fair)	3	33%
1 (good)	2	22%
1 (very good)	2	22%

Figure 3.18: Assessment of the saving procedure of the annotation tool.



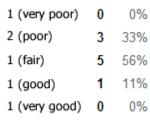
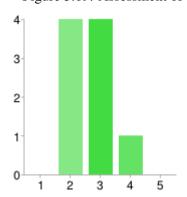


Figure 3.19: Assessment of the concepts search procedure of the annotation tool.



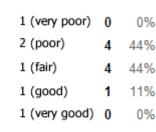


Figure 3.20: Assessment of the RDF triples search procedure of the annotation tool.



A

# Questionnaires used

In the following pages we include the questionnaires used for the qualitative evaluation of the first cycle of BIOASQ.



# **BioASQ** evaluation form for challenge participants

Short survey on the quality of the challenge, from the participant point of view. For more information about BioASQ, please visit <a href="http://bioasq.org">http://bioasq.org</a>.

\* Required



## Learning about BioASQ

1.	How did you hear about BioASQ? *  Mark only one oval.
	Web site
	Mailing list
	Personal contact
	Twitter
	LinkedIn
	Other:
2.	How easy was it to understand the tasks overall? *  Mark only one oval.  1 2 3 4 5
	Very difficult Very easy

## Registration

	Very bad	Bad Fai	r Good	Very good	
Registration guidelines					
Registration platform					_
					_
isk 1A					
ase answer the following qu	estions onl	y if you par	ticipated	n Task 1A.	
Please rate Task 1A acc	ording to	the followi	ng.		
Mark only one oval per rov	_		J		
		Very bad	Bad I	air Good	Very good
Guidelines					
Data format					
Data quality					
	dina				
Downloading and upload procedures	an ig				
	se of test				
procedures  Scheduling (e.g., releas	se of test				
Scheduling (e.g., releas sets, time to submit res	se of test sults, etc.)				
Scheduling (e.g., releas sets, time to submit res  Evaluation methods  Notifications (e.g., releas	se of test sults, etc.)				

6.	Additional comments  Anything not covered by the questions	above.				
			•			
Га	sk 1B Phase A					
lea	ase answer the following questions only	, if you par	ticipated	d in Ta	sk 1B F	Phase A.
7.	Please rate Task 1B Phase A accor	rding to th	e follov	ving.		
	Mark only one oval per row.					
		Very bad	Bad	Fair	Good	Very good
	Guidelines					
	Data format					
	Data quality					
	Number of questions					
	Diversity of questions					
	Difficulty of questions (how difficult were the questions)					
	Downloading and uploading procedures					
	Other supporting software and web-services (e.g., searching for concepts, articles, etc.)					
	Scheduling (e.g., release of test sets, time to submit results, etc.)					
	Evaluation methods					
	Notifications (e.g., release of test sets, evaluation results, etc.)					
	Technical support					

Overall impression

	above.				
ask 1B Phase B					
ease answer the following questions only	if you part	ticipated	d in Tas	sk 1B P	Phase B.
Please rate Task 1B Phase B accor Mark only one oval per row.	ding to the	e follov	ving.		
	Very bad	Bad	Fair	Good	Very good
Guidelines					
Data format					
Data format  Data quality					
Data quality					
Data quality  Number of questions					
Data quality  Number of questions  Diversity of questions  Difficulty of questions (how difficult					
Data quality  Number of questions  Diversity of questions  Difficulty of questions (how difficult were the questions)  Downloading and uploading					
Data quality  Number of questions  Diversity of questions  Difficulty of questions (how difficult were the questions)  Downloading and uploading procedures  Scheduling (e.g., release of test					
Data quality  Number of questions  Diversity of questions  Difficulty of questions (how difficult were the questions)  Downloading and uploading procedures  Scheduling (e.g., release of test sets, time to submit results, etc.)					

8. Additional comments

Overall impression

10.	Anything not covered by the questions above.
٥١	verall impression
11.	What is your overall impression of BioASQ *  Mark only one oval.
	1 2 3 4 5
	Very bad Very good
12.	Will you participate in the next year's BioASQ Challenge? *  Mark only one oval.
	Yes
	Maybe No
13.	Will you recommend the BioASQ Challenge to others? *  Mark only one oval.
	Yes
	Maybe
	No
Co	ontact details
14.	Name *
15.	Email *

16.	May we contact you in due course? *  Mark only one oval.
	Yes
	No

# **Workshop Assessment Survey BioASQ**

Short survey to assess the BioASQ workshop. More information on the project can be found at <a href="http://bioasq.org/">http://bioasq.org/</a>.

\* Required

## **General Information**

Please provide us with information about your participation to the workshop

1.	Where did you hear about BioASQ * Mark only one oval.
	Mailing List
	Personal Contact
	LinkedIn
	Twitter
	Other:
2.	Did you participate in the challenge? *
	Mark only one oval.
	No
	Yes, in Task 1a only
	Yes, in Task 1b only
	Yes, in Task 1a and Task 1b
3.	If not, why are you not participating?
	Mark only one oval.
	Time restrictions
	Not my area of research
	BioASQ unknown so far
	Other:

No Yes, in Task 2a Yes, in Task 2b Yes, in both tasks Other:  Orkshop Organization  Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good Scientific presentations  Keynotes BioASQ presentation Panel discussion	No Yes, in Task 2a Yes, in Task 2b Yes, in both tasks Other:  //Orkshop Organization  Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good Scientific presentations  Keynotes BioASQ presentation Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	١.	Are you planning to parti	icipa	te in	the I	Bio	AS	Q 1	trac	k at	CLE	F 2014′	*		
Yes, in Task 2b Yes, in both tasks Other:  Orkshop Organization  Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Yes, in Task 2b Yes, in both tasks Other:    Very bad   Bad   OK   Good   Very good		_													
Yes, in both tasks Other:  Orkshop Organization  Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good Scientific presentations Keynotes BioASQ presentation Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Yes, in both tasks Other:    Vorkshop Organization		Yes, in Task 2a													
Other:    Corkshop Organization	Other:  // Orkshop Organization  Please evaluate the following parts of the workshop. *  // Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		Yes, in Task 2b													
Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		Yes, in both tasks													
Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Please evaluate the following parts of the workshop. *  Mark only one oval per row.  Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		Other:													
Wark only one oval per row.   Very bad Bad OK Good Very good   Scientific presentations OK Good Very good   Keynotes OK OK Good Very good   BioASQ presentation OK OK Good Very good   BioASQ presentation OK	Very bad Bad OK Good Very good  Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	/(	orkshop Organiza	atio	n											
Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Scientific presentations  Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	j_														
Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Keynotes  BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		0 : 15	Very	bad	Ba	d	Oł	<u> </u>	Go	ood	Very	good			
BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	BioASQ presentation  Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		<u> </u>				<u> </u>		<u> </u>		$\supseteq$					
Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?	Panel discussion  Do you have any other suggestions to help us improve the organization of the workshop?		Keynotes													
Do you have any other suggestions to help us improve the organization of the workshop?	Do you have any other suggestions to help us improve the organization of the workshop?		BioASQ presentation				$\supset$		$\supset$							
workshop?	workshop?		Panel discussion				$\bigcirc$		$\supset$							
		6.	Do you have any other so workshop?					p u	s i	mp	rove	e the	organi	zatio	n of	th
							•			•						
How could the promotion of the workshop be improved?																
How could the promotion of the workshop be improved?																
How could the promotion of the workshop be improved?																
How could the promotion of the workshop be improved?																

## **Personal Details**

8.	Name
9.	Email Address
10.	May we follow up with you if required?  Mark only one oval.
	Yes No

## **BioASQ Biomedical experts questionnaire**

Please rate your experience as a member of the BioASQ team of biomedical experts

\* Required



#### **Annotation tool**

Please rate the following functionalities of the annotation tool on a scale of 1 - 5

- 1. Very poor: I was unable to use it.
- 2. Poor: Needs substantial improvements.
- 3. Fair: I could use it but still needs some improvements
- 4. Good: Almost everything worked smoothly. With a few improvements it would be excellent

). V	ery good: E	verytning	worked	smooth	iy. NO ir	nprovem	ent is neede
1.	Registration  Mark only						
		1	2	3	4	5	
	Very poor						Very good
2.	Question of Mark only		*				
	1	2	3	4	5		
						-	
3.	Concepts  Mark only						
	1	2	3	4	5		
						-	

1	2	3	4	5
Statemei Mark only				
1	2	3	4	5
Snippets Mark only				
1	2	3	4	5
Exact and Mark only				
1	2	3	4	5
1	2	3	4	5
Ideal ans	swer cre	eation *	4	5
Ideal ans	swer cre	eation *	4	5
deal ans	swer cre	eation *		
Ideal ans Mark only  1  Saving y	swer cre one ove  2  our wor	eation * al. 3		
Ideal ans	swer cre one ove  2  our wor	eation * al. 3		
Ideal ans Mark only  1  Saving y Mark only	ewer cre one ove  2  Our wor	eation * al.  3  k * al.	4	5
Ideal ans Mark only  1  Saving y Mark only	our wor	eation *  al.  3  k *  al.  3  on *	4	5

11.	What did you like most in the tool?
12.	What did you like less in the tool?
13.	Would you use this tool again in the future? *  Mark only one oval.  Yes  Yes, if some improvements are made  No
14.	Please give a short justification
15.	Would you recommend this tool to others? *  Mark only one oval.  Yes  No
16.	Please give a short justification

17.	Do you the			use the	tool in yo	ur own work (e.g., to organize a search)?
	( ) Ye	es				
			ne impro	vement	s are made	
	O No	)				
18.	Please giv	ve a sho	rt justific	ation		
	***************************************				***************************************	
As	sessm	ent T	ool			
Plea	ase rate the	e followii	ng functi	onalities	of the ass	sessment tool on a scale of 1 - 5
	ery bad: I					
	ad: Needs air: I could					ements
4. G	Good: Almo	st every	thing wo	rked sn	noothly. W	th a few improvements it would be excellent provement is needed.
		•	_		ouny. 140 m	provement to needed.
19.	Ideal and Mark only			nt *		
	Wark Orny	0110 010				
	1	2	3	4	5	
20	Exact an	ewore a	eeo eem (	net *		
20.	Mark only			7111		
					_	
	1	2	3	4	5	
21.	Snippets	a sse ssr	nent *			
	Mark only	one ova	al.			
	1	2	3	4	5	

1 2 3 4 5  Documents assessment *	
Documents assessment *	
Documents assessment *	
Mark only one oval.	
1 2 3 4 5	
Statements assessment * Mark only one oval.	
1 2 3 4 5	
Saving your work *  Mark only one oval.  1 2 3 4 5	
1 2 3 4 3	
Overall impression *	
Mark only one oval.	
Mark only one oval.  1 2 3 4 5	
1 2 3 4 5	
1 2 3 4 5	

22. Concepts assessment \*

	u use th	is tool a		n the futur				
1	2	3	4	5				
Please give	e a short	tjustifica	ation					
Would yo	u recom	nmend 1						
Would yo	u recom	nmend 1						
Would yo	u recom	nmend 1	this too	l to others				
Would your Mark only of	u recom one oval	3	this too	l to others				
Would your Mark only on the second of the se	u recomone oval	amend to	this too	l to others	s? *			
Would your Mark only and the second of the s	u recomone oval	amend to	this too	of to others	s? *			
Would your Mark only and the second of the s	u recomone oval	amend to	this too	of to others	s? *			

	1	2	3	4	5			
Very bad						Very good		
Please ad	d ideas/	comme/	nts of p	ossible	ways o	f improvinç	j BioASQ.	
ontact o								
ontact o								
	letails	<b>3</b>						
ontact c	letails	<b>3</b>						
ontact c	letails	•						