Competence assessment algorithm of accounting and economic specialists in the petroleum sector

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Abstract. The paper describes the modern competence assessment methodology for economic and accounting specialists in the petroleum sector. The research object is professional competence and assessment approaches. The paper provides the specifications and codifiers developed by the team of contributors.

1 Introduction

Under rapidly changing market conditions, there is a need for advanced personnel development to ensure the effective activity of any enterprise. The process of advanced personnel development is accompanied by an initial assessment of personnel knowledge and skills. Therefore, some major companies, including those in the petroleum sector could recourse to external organizations [1]. Thus, the research in personnel technical competence development has been carried out within the Department of Natural Resources Economics, National Research Tomsk Polytechnic University for one of the leading oil and gas companies.

2 Materials and methods

The following conceptual framework was used:

- *Professional competence* the willingness and ability to act in accordance with the business requirements, task and problem-solving methodically and independently, as well as self-estimation of one's activities [2];
- *Test specification* (lat. *specificatio* listing one's features) a document that provides the targets, objectives, plan and test structure, as well as the basic requirements for testing, result analysis and interpretation [3];
- *Codifier* a test item structure, which reflects the controlled competence content, item list and need justification [4].

To develop the general competence profile (Table 1), a 4-level competence system (beginning, user, experienced and expert) has been applied.

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3 Results and discussion

Work target included (Table 1) initial object analysis based on complied test items for personnel competence assessment. According to the obtained results, follow-up study was carried out and an advanced personnel training program was presented.

Table 1. Competence specialist assessment algorithm.

Stage 1 “Object analysis”	
<div><div>✓</div> study the role of organizational technical units within production process of a company;</div> <div><div>✓</div> identify the characteristics of relevant personnel knowledge and skills as profiles and professional competences</div>	
Stage 2 “Development of test tasks”	
2.1 General competence profile formation	<div><div>✓</div> determine the number of test questions for one specialist (Table 2);</div> <div><div>✓</div> reflect the knowledge and skills requirements for job position</div>
2.2 Codifier formation	<div><div>✓</div> Present all competence modules;</div> <div><div>✓</div> codifier of test examples (Table 3)</div>
2.3 Specification formation	<div><div>✓</div> includes the main characteristics of the test content for each employee (required competence level , a certain number of questions for each structural unit, point-rating scoring system and performance time);</div> <div><div>✓</div> test completion time according to job position: heads of departments - 120 minutes, for all other professionals -80 minutes,</div> <div><div>✓</div> example of test specifications (Table. 4)</div>
2.4 Test item development	<div><div>✓</div> multiple choice test including 4 numbered answer options from which one or more numbers corresponding to the correct answer should be chosen [3];</div> <div><div>✓</div> multiple choice ;</div> <div><div>✓</div> common test bank (960 test items)</div>
Stage 3 “Approbation”	
3.1 Trial testing	<div><div>✓</div> submitted report audit on the test task development involving codifiers and specifications</div>
3.2 Analysis of the results	<div><div>✓</div> number of questions increased up to 8 in sampling</div>
3.3 Follow-up assessment system	<div><div>✓</div> follow-up assessment system based on obtained analysis results</div>
Stage 4 “Personnel testing”	
Personnel final testing was conducted by the company itself	
Stage 5 “Advanced professional training development”	

Due to the obtained test results, the activity plan for advanced professional training was proposed

Table 2. Total number of competence questions [5].

PROFESSIONAL COMPETENCE PROFILE		Number of competences					Percentage, %	Number of questions
		1 - beginning	2 - user	3 - experienced	4 - expert	Total		
Accounting and tax records	1. General principles, elements and types of accounting	17	27	21	1	66	6.2	60
	2. Methodology and regulations (RAS)	19	34	13	0	66	6.2	60
	3. Tax legislation, maintaining tax records	23	26	17	0	66	6.2	60
	4. IFRS accounting principles	32	13	1	0	46	4.3	42
Knowledge of business organization	5. Incorporation documents, policies and procedures	35	23	5	0	63	5.9	57
	6. Institutional environment	34	33	6	0	73	6.9	66
	7. Business trends	28	15	6	0	49	4.6	44
Processes	8. RF Accounting and Reporting	18	23	12	0	53	5.0	48
	9. Taxes	11	16	3	0	30	2.8	27
	10. Purchase records	0	3	0	0	3	0.3	3
	11. Sale records	5	9	4	0	18	1.7	16
	12. Inventory count	0	11	1	0	12	1.1	11
	13. Assets Accounting	0	10	1	0	11	1.0	10
	14. Capital investment records	2	15	1	0	18	1.7	16
	15. Investment accounts	3	9	1	0	13	1.2	12
	16. Accounting credit, loan and collateral for obligations	5	9	0	1	15	1.4	14
	17. Purchasing services	8	11	0	1	20	1.9	18
	18. Rendering services	8	11	0	1	20	1.9	18
	19. Accounting for banking transactions	5	14	0	1	20	1.9	18
	20. Cost Accounting and value formation	0	9	3	0	12	1.1	11
	21. Salary Accounting and Payroll	2	10	5	0	17	1.6	15
	22. Employee advances	1	7	3	0	11	1.0	10
IT skills	23.SAP FI	17	37	4	0	58	5.5	52
	24.SAP CO	18	15	3	0	36	3.4	33

	25.SAP FI-AA	6	10	3	0	19	1.8	17
	26.1C	14	38	7	0	59	5.6	53
	27. Electronic archive system	17	21	0	0	38	3.6	34
	28.MS Office	6	52	17	0	75	7.1	68
	29.Lotus Notes	0	0	0	0	0	0.0	0
	30.Internet/Intranet	12	53	10	0	75	7.1	68
Total competences		346	564	147	5	1062	100	960
Percentage, %		32.6	53.11	13.84	0.47	100%	*	*
Number of questions, total		313	510	133	5	960	*	
The average number of test questions for professional competence assessment		10	17	4	1	32		

Table 3. Test example codifier of an enterprise competence assessment (Business and tax accounting).

Competence module	Competences	Target of competence assessment	Qualification requirements	Competence level	Difficulty level of test items
Accounting and tax accounting	1.2 Methodology and regulations (RAS - Russian Accounting Standards) Knows the methodology and regulations (RAS) governing the Russian enterprises accounting; (Civil Code of the Russian Federation, federal laws and government, regulations, the Russian Finance Ministry	1.1.1 Provides established law and regulations compliance of the Russian Federation in the field of organization and record keeping at the enterprise.	Knowledge	1	beginning
		1.1.2 Possesses skills of application of the Russian Accounting Standards, guidelines, regulations and corporate accounting policy.	Understanding		

	accounting regulations; sectoral and professional associations' recommendation s).	1.1.3 Enhances profound knowledge of Russian Statutory Accounting to one specific type of work; distinguishes tax, regulatory and financial accounting.	Knowledge	2	user
		1.1.4 Applies the Russian Federation laws and regulations in view of amendments and modifications in the field of accounting.	Application		
		1.1.5 Selects the oil and gas industry accounting process to improve the corporate accounting policy for one specific type of work	Synthesis		
		1.1.6 Assists other colleagues or checks the accounting transaction implementation.	Application		
		1.1.7 Possesses approach and technology accounting process knowledge of different types of accounting.	Knowledge	3	experienced
		1.1.8 Understands accounting process relationships in package, as well as at the detailed description level.	Understanding		
		1.1.9 Understands and answers the complex and specific questions concerning methodology, accounting; solves accounting organization issues	Analysis		
		1.1.10 Forms corporate accounting policy, taking into account the subsidiaries peculiarities; understands the particular accounting policy of OJSC "Gazprom Neft"; understands the accounting and financial reporting relationship	Synthesis		

Table 4. General test structure for Chief Accountant, Project manager of close and formation accounting statements.

Department of close and formation of financial statements		Competence level	Number of questions	Total score	Test timing
Chief Accountant, Project Manager					
Accounting and tax records	1. General principles, elements and types of accounting	3	1	3	120 min.
	2. Methodology and regulations (RAS)	3	1	3	
	3. Tax legislation, maintaining tax records	3	1	3	
	4. IFRS accounting principles	2	1	2	
Knowledge of business organization	5. Incorporation documents, policies and procedures	3	1	3	
	6. Institutional environment	3	1	3	
	7. Business trends	3	1	3	
Processes	8. RF Accounting and Reporting	3	2	6	
	9. Taxes	2	1	2	
	10. Purchase records	2	1	2	
	11. Sale records	2	1	2	
	12. Inventory count	2	1	2	
	13. Assets Accounting	2	1	2	
	14. Capital investment records	2	1	2	
	15. Investment accounts	2	1	2	
	16. Accounting credit, loan and collateral for obligations	2	1	2	
	17. Purchasing services	2	1	2	
	18. Rendering services	2	1	2	
	19. Accounting for banking transactions	2	1	2	
	20. Cost Accounting and value formation	2	1	2	
	21. Salary Accounting and Payroll	2	4	8	
	22. Employee advances	2	1	2	
IT skills	23.SAP FI	1	1	1	
	24.IC	1	2	2	
	25. Electronic archive system	1	1	1	
	26.MS Office	2	1	2	
	27.Internet/Intranet	2	1	2	
Competence levels	1 - beginning	3	4	4	
	2 - user	17	20	40	

	3 - experienced	7	8	25	
	TOTAL	27	32	69	

According to the general competence profile, codifiers and specifications, test bank was developed (Table 2).

The results of such personnel testing are the following:

- description of the professional competence assessment stages and techniques;
- profile description of technical knowledge and skills required for positions, by codifiers and specifications for each company specialist;
- common test bank;
- professional competence assessment results via a testing method;
- knowledge and skills inventory of the petroleum specialists via the developed tests (especially after the restructuring);
- obtained data analysis of the technical strengths and weaknesses of the specialists and the enterprise,
- sustainable competitive ability of the enterprise and its subdivisions within this or that sector;
- follow-up revision of the personnel assessment results;
- program development of advanced professional training reflecting obtained analysis results (optimized training programs planning; feedback; job position requirements).
- motivation in personal development and career growth.

It is worth noting that such an approach is effectively being used in several petroleum companies: employee performance efficiency mechanism, as well as testing (preliminary and post professional training); growth dynamics [6].

4 Conclusion

This competence assessment algorithm is of great importance, both for Personnel Development Department officers and for any employee who is responsible for decision-making in the HR Policy, as well as for personal and career development. The results of the tests will affect the production optimization and operation of the company itself.

References

1. R. Pillai, An empirical study on the role of HR practices in knowledge sharing with special reference to IT / ITeS firms, International Journal of Applied Engineering Research, **11(6)**, 3814-3818 (2016)
2. V.I. Baydenko, Competence approach in design of the State Educational Standard of Higher Professional Education. Moscow 2005 114 (2005) [in Russian]
3. N.S. Mihaylova, Development of test materials (Tomsk: Publishing house TPU, 2008) [in Russian]
4. N.S. Mihaylova, M.G. Minin, E.A. Muratova, Assessment tools development in educational programs design (Tomsk: TPU, 2007)
5. M.P. Lyubyatinskaya, V.B. Romanyuk, Tools of knowledge and skills estimation of accounting and economic services of oil and gas companies, Siberian financial school, **6(83)**, 122-125 (2010)

6. V.B. Romanyuk et al., Systematic approach in petroleum personnel competence assessment, IOP Conference Series: Earth and Environmental Science, **43**, 012090 (2016)