

# XXV IASP World Conference on Science & Technology Parks

The role of science parks in accelerating knowledge economy growth – contrasts between emerging and more developed economies



**IASP**

International Association  
of Science Parks



14 - 17 September 2008, Sandton Convention Centre, Gauteng, South Africa

## XXV IASP World Conference 2008

### *A Conceptual Model for Job Analysis of Incubator's Managers Based on ONET Model*

*Parallel Session 5:  
Staffing of Science Parks*

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## A Conceptual model for job analysis of Incubators' managers based on ONET model

### Executive Summary

At present, there are about 5000 persons act as incubator's managers all over the world. By supporting entrepreneurs and promoting entrepreneurship they help to reach job creation, leverage economic growth and provision of social welfare in their countries.

Meanwhile, there are about 50 incubator managers working in Iran (about 1% of the population of Incubator managers of the world) which has lead Iran to be a suitable candidate for the current research.

Although the managerial methods and techniques plays an important role and acts as a key performance index for the success of an incubator, but the personal character of the Incubator manager, as the head of the human resources in the organization, has also a great influence on performance of the employees activities and on the development of the incubators. So It could be considered that the differences and successes of various incubators in the world, intensively depends on its manager's thoughts and attitudes.

In the current paper, the characteristic of incubator managers has been analyzed

Moreover, the job analysis of incubators managers could ease the process of electing managers and determine the requirements of the managers during their management life, leading improvements in productivity of the incubators.

In the current paper, based on standard theoretical job analysis and design schemes, and using the Onet content model and Holland Code Career Model, we have evaluated the most important job elements of incubator's managers; specially 'Tasks', 'Skills', and 'Personality'. Moreover, in order to compare and analyze the gap between current and ideal state of the elements, a population of thirty Iranian incubator managers has been studied.

*Keywords: incubators' Staffing, ONET model, job analysis, STP's staffing*

## The Onet Content Model:

In order to estimate the characteristics, skills, knowledge, education and experience required for successful management of incubators, the Onet content model and ratings has been used as a reference.

The model provides a framework that identifies the most important types of information about job and integrates them into a theoretically and empirically sound system.

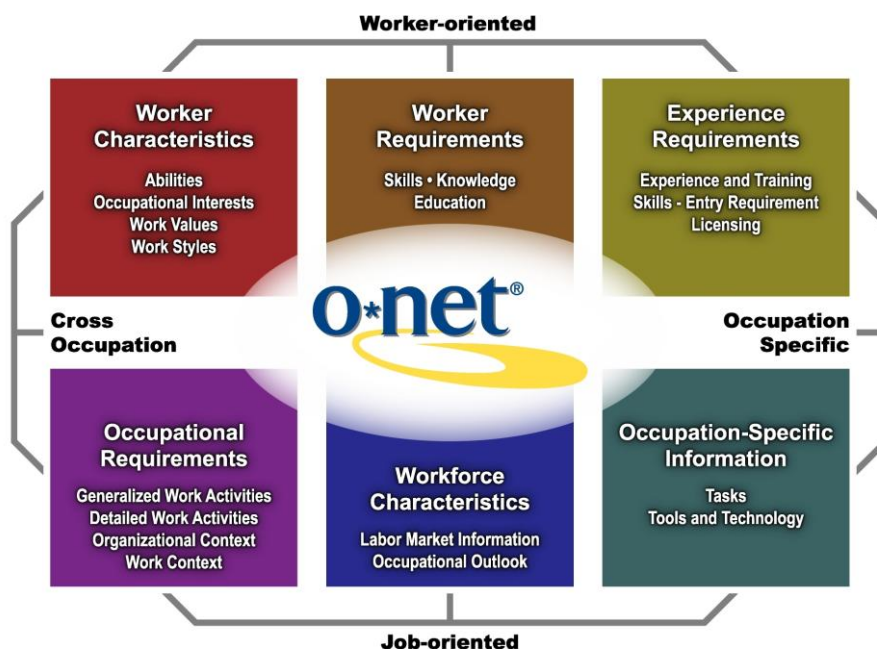


Figure 1: Onet Content Model

The Model embodies a view that reflects the character of occupations (via job-oriented descriptors) and people (via worker-oriented descriptors) and it also allows occupational information to be applied across jobs, sectors, or industries (cross-occupational descriptors) and within occupations (occupational-specific descriptors). These descriptors are organized into six major domains as illustrated in Figure 1, which enable the user to focus on areas of information that specify the key attributes and characteristics of workers and occupations. The Domains include:

1. **Worker Characteristics:** Includes enduring characteristics that may influence both work performance and the capacity to acquire knowledge and skills required for effective work performance; and are classified in four major Sub-domains naming:
  - **Abilities:** Ability is enduring attributes of the individual that influence performance.
  - **Occupational interests:** Occupational interests are Preferences for work environments
  - **Work Values:** Work Values are Global aspects of work composed of specific needs that are important to a person's satisfaction
  - **Work Style:** The term Work Style is defined as Personal characteristics that can affect how well someone performs a job.

2. **Worker Requirements:** Includes descriptors referring to work-related attributes acquired and/or developed through experience and education and are branched through four major Sub-domains naming:
  - **Skills:** Skills are classified in two sub-domains, naming Basic skills and Cross functional Skills; where basic Skills refers to Developed capacities that facilitate learning or the more rapid acquisition of knowledge, and Cross functional Skills are considered as Developed capacities that facilitate performance of activities that occur across jobs, naming Social skills, Complex problem solving, Resource management, and System and Technical skills.
  - **Knowledge and Education:** The required knowledge and education Include Technical Vocational, Business Vocational, English/language Arts, Oral Communication, Languages, Basic Math, Advanced Math, Physical Science, Computer Science, Biological Science, Applied Science, Social Science, Arts, Humanities, Physical Education
  - **Experience Requirements:** defines requirements related to previous work activities and explicitly linked to certain types of work activities. The Experience Requirements are divided to four sub-domains namely:
  - **Experience and Training:** consists of the related work experiences, On-site/In-plant Training, and On-Job Trainings.
  - **Basic Skills-Entry Requirement:** Includes the entry requirement for developed capacities that facilitate learning or the more rapid acquisition of knowledge namely Reading Comprehension, Active Listening, Writing, Speaking, Mathematics, Science, Critical Thinking, Active Learning, Learning Strategies, Monitoring, Social Skills ( Negotiation, Persuasion, Coordination, etc), Technical Skills, Systems Skills, Resource Management Skills, etc.
  - **Licensing:** Licenses, certificates, or registrations that are awarded to show that a job holder has gained certain skills. This includes requirements for obtaining these credentials, and the organization or agency requiring their possession.
3. **Occupational-Specific Information:** Occupation-specific information details a comprehensive set of elements that apply to a single occupation or a narrowly defined job family. This domain parallels other Content Model domains because it includes requirements such as work-related knowledge, skills, and tasks in addition to the machines, equipment, tools, software, and information technology workers may use in their workplace. Labor market information defined by the industry or occupation is also provided here. This domain is particularly important when developing specific applications of ONET information. For example, it is necessary to refer to occupation-specific descriptive information to specify training, develop position descriptions, or redesign jobs.
4. **Labor Market Characteristics:** The current item refers to variables that define and describe the general characteristics of occupations that may influence occupational requirements including labor Market information (Occupational statistics) which is the current characteristics of occupations, and Occupational Outlook (Occupational Projections) which refers to the future labor force characteristics of occupations.

5. **Occupational requirements:** a comprehensive set of variables or detailed elements that describe the requirements of various occupations and includes information about typical activities required across occupations. Moreover the domain include: Looking for and Receiving Job-Related Information, Identify and Evaluating Job-Relevant Information, Information and Data Processing, Reasoning and Decision Making, Performing Physical and Manual Work Activities, Performing Complex and Technical Activities, Communicating and Interacting, Coordinating, Developing, Managing, Advising, Administering, Communication, Structural job characteristics, and etc.

### Holland Code Career Model:

The Holland Code Career Model has matched jobs into job codes, interest clusters, work personality environments, and work personality types. The occupation codes are:

- **Realistic (Doer):** This type prefers work that requires technical, mechanical, physical or athletic skill; often enjoys working with their hands, or with tools, machines, or objects.
- **Investigative (Thinker):** This is the scientific, task-oriented type who likes to learn, know, analyze, and observe; and prefers work that requires abstract thinking and creative problem-solving.
- **Artistic (Creator):** Artistic types like to work in unrestricted situations using their imagination and creativity, where originality in language, writing, design, performance, or products is required.
- **Social (Helper):** This type is humanistic, team-oriented and concerned with the welfare of others. Enjoys communicating and working with people to help, enlighten, educate, train or inform.
- **Enterprising (Persuader):** Leading others to attain organizational goals or economic gain. They prefer work that rewards their ability to sell, persuade, and motivate others.
- **Conventional (organizer):** Those who enjoy highly-structured, office or clerical tasks that requires efficient, systematic manipulation of data or numbers and consistent adherence to a prescribed plan.

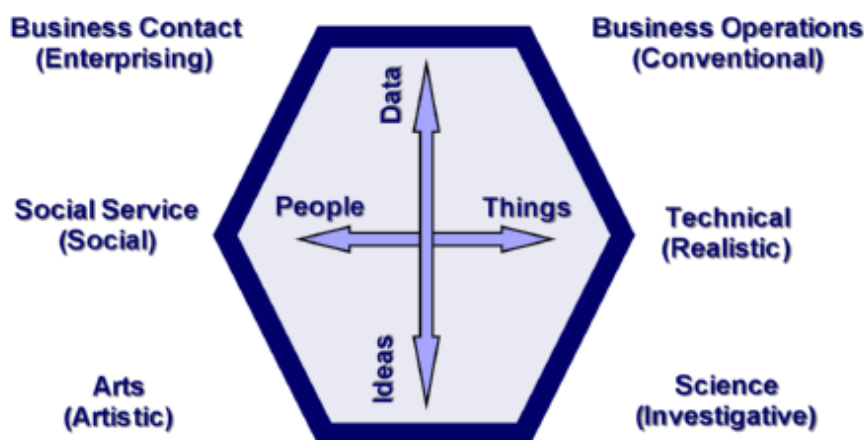


Figure 2: Holland Hexagon

## Limitations and Solutions:

The research team faced two major limitations and problems that had to deal with:

1. Unavailability of global and standard definitions and specifications for the occupation of incubator management
2. The inadequacy of the number of experts in the location under study

## Unavailability of global and standard definitions and specifications:

Since there were no specific definition and detailed information about tasks and skills of incubator managers, because of the similarities between the goal occupation and six occupations namely: Administrative Services management, Chief Executive, Financial management, Human resource management, Training and developing management, and General and Operational management, the goal occupation was considered as an inherited entity from the six mentioned occupations, but with different levels of strength (Figure 3). The related information for the mentioned tasks has also been officially provided by Onet, with thousands of experts joining the evaluation program.

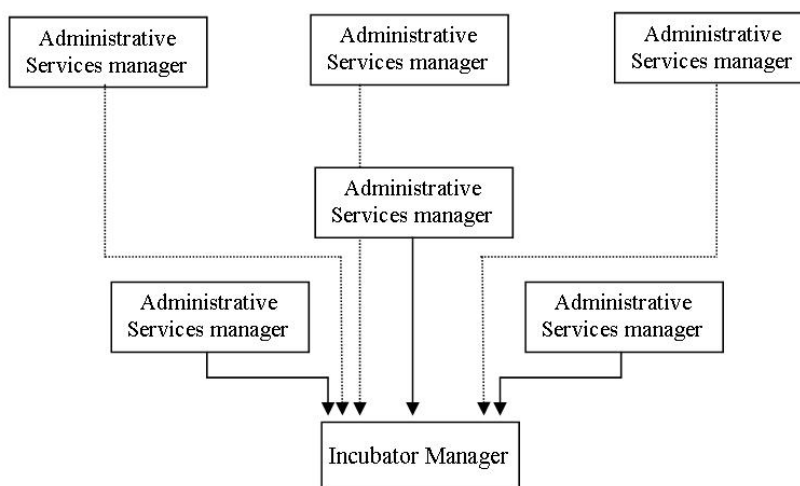


Figure 3: The occupation of Incubator Management has considered inherited by six management occupations.

## The inadequacy of the number of experts in the location under study:

In the Onet model, the evaluation of domains and different aspects of a profession is carried out using standard questioners. The standard questioners have to be filled out by a vast majority of experts who have the sufficient knowledge and experience in the goal profession in order to be acceptable. Since the population of experts, familiar with the job of incubators management in Iran was insufficient, the following phases were performed in order to gain more detailed information and high quality information:

1. As for the first phase, questionnaires have been sent to thirty incubator managers requesting their tasks and skills. After providing complete information and characteristics of the six key occupations, used as a resource in the current research, the managers were asked to emphasize their idea about the percentage of similarities between their occupation and the key occupations.
2. At the second phase, managers of the five most successful incubators who had an experience of more than five years in their position were invited for professional interviews.

3. The results of the questionnaires and the information collected via interviews were compared and the characteristics and models of the goal occupation (Management of Incubators) were developed.

Having the information collected from thirty incubator managers at the first phase and more detailed information and official documents, collected from the five most successful and well known incubators of Iran, interesting results were discovered leading to the discovery of the required tasks and skills for incubator managers and also their key personality.

**Phase 1- Questionnaires:**

As mentioned before, due to unavailability of sufficient information for the occupation of Incubator management, different occupations were rated by thirty incubator managers using questionnaires. The test-takers had been provided with complete information about the occupations.

The six highest rated occupations were: "Administrative services management", "Chief executive", "Financial management", "General and Operational management", "Human Resources management", "Training and Development management". It is also considering that the other management occupations listed by Onet have not achieved a high percentage (1.1% as shown in table 1).

The result of the test clarified the average similarities between the occupation of incubator management and the other management occupations, from the view of the test-takers.

Occupations	Onet Code	Similarity (%)
Administrative Services manager	11-3011.00	18.1 %
Chief Executives	11-1011.00	25.7 %
Financial Managers	11-3031.00	6.1 %
General and Operations Managers	11-1021.00	12.7 %
Human Resources Managers	11-3040.00	27.6 %
Training & Development Managers	11-3042.00	8.7 %
Other Occupations		1.1%

Table 1: Contribution of every Onet standard occupations (out of 100), resulted by the ratings.

The results showed that most incubator managers that participated in the test, believed themselves as human resource managers and chief executives.

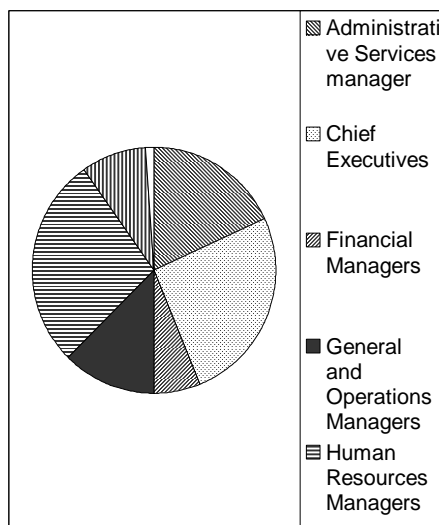


Figure 4: Similarity Percentage Chart; including Onet standard occupations

## Phase 2- Professional Interviews:

As for further studies, managers of the five most successful incubators who had an experience of more than five years in their position were invited for professional interviews.

During the interview they were all requested to provide detailed information about their tasks and skills in order to compare with the results of the phase 1.

### Results of Required tasks for Incubator management:

Tables 2 to 7 show the required tasks for the key Management occupations that have the most similarities to the goal occupation.

Importance	Category	Task
79	Core	Monitor the facility to ensure that it remains safe, secure, and well-maintained.
77	Core	Direct or coordinate the supportive services department of a business, agency, or organization.
74	Core	Set goals and deadlines for the department.
71	Core	Prepare and review operational reports and schedules to ensure accuracy and efficiency.
59	Core	Analyze internal processes and recommend and implement procedural or policy changes to improve operations, such as supply changes or the disposal of records.
54	Core	Acquire, distribute and store supplies.
77	Supplemental	Plan, administer and control budgets for contracts, equipment and supplies.
71	Supplemental	Oversee construction and renovation projects to improve efficiency and to ensure that facilities meet environmental, health, and security standards, and comply with government regulations.
70	Supplemental	Hire and terminate clerical and administrative personnel.
67	Supplemental	Oversee the maintenance and repair of machinery, equipment, and electrical and mechanical systems.
50	Supplemental	Manage leasing of facility space.
49	Supplemental	Participate in architectural and engineering planning and design, including space and installation management.
48	Supplemental	Conduct classes to teach procedures to staff.
39	Supplemental	Dispose of, or oversee the disposal of, surplus or unclaimed property.

Table 2: Required tasks for Administrative Services Managers (code: 11-3011.00)

Importance	Category	Task
88	Core	Direct and coordinate an organization's financial and budget activities in order to fund operations, maximize investments, and increase efficiency.
85	Core	Confer with board members, organization officials, and staff members to discuss issues, coordinate activities, and resolve problems.
84	Core	Analyze operations to evaluate performance of a company and its staff in meeting objectives, and to determine areas of potential cost reduction, program improvement, or policy change.
80	Core	Direct, plan, and implement policies, objectives, and activities of organizations or businesses in order to ensure continuing operations, to maximize returns on investments, and to increase productivity.
78	Core	Prepare budgets for approval, including those for funding and implementation of programs.
77	Core	Direct and coordinate activities of businesses or departments concerned with production, pricing, sales, and/or distribution of products.
76	Core	Negotiate or approve contracts and agreements with suppliers, distributors, federal and state agencies, and other organizational entities.
75	Core	Review reports submitted by staff members in order to recommend approval or to suggest changes.
74	Core	Appoint department heads or managers, and assign or delegate responsibilities to them.
74	Core	Direct human resources activities, including the approval of human resource plans and activities, the selection of directors and other high-level staff, and establishment and organization of major departments.
71	Core	Preside over or serve on boards of directors, management committees, or other governing boards.
70	Core	Prepare and present reports concerning activities, expenses, budgets, government statutes and rulings, and other items affecting businesses or program services.



Importance	Category	Task
69	Core	Establish departmental responsibilities, and coordinate functions among departments and sites.
69	Core	Implement corrective action plans to solve organizational or departmental problems.
66	Core	Coordinate the development and implementation of budgetary control systems, recordkeeping systems, and other administrative control processes.
65	Core	Direct non-merchandising departments such as advertising, purchasing, credit, and accounting.
63	Core	Deliver speeches, write articles, and present information at meetings or conventions in order to promote services, exchange ideas, and accomplish objectives.
77	Supplemental	Serve as liaisons between organizations, shareholders, and outside organizations.
77	Supplemental	Review and analyze legislation, laws, and public policy, and recommend changes to promote and support interests of both the general population and special groups.
70	Supplemental	Nominate citizens to boards and commissions.
69	Supplemental	Interpret and explain policies, rules, regulations, and laws to organizations, government and corporate officials, and individuals.
68	Supplemental	Make presentations to legislative and other government committees regarding policies, programs, or budgets.
67	Supplemental	Refer major policy matters to elected representatives for final decisions.
67	Supplemental	Administer programs for selection of sites, construction of buildings, and provision of equipment and supplies.
67	Supplemental	Direct and coordinate activities of businesses involved with buying and selling investment products and financial services.
65	Supplemental	Direct and conduct studies and research on issues affecting areas of responsibility.
64	Supplemental	Attend and participate in meetings of municipal councils and council committees.
62	Supplemental	Organize and approve promotional campaigns.
61	Supplemental	Conduct or direct investigations or hearings to resolve complaints and violations of laws, or testify at such hearings.
57	Supplemental	Represent organizations and promote their objectives at official functions, or delegate representatives to do so.
48	Supplemental	Prepare bylaws approved by elected officials, and ensure that bylaws are enforced.
30	Supplemental	Direct and coordinate activities between the United States Government and foreign entities in order to provide information and promote international interests and harmony.

Table 3: Required tasks for Chief Executives (11-1011.00)

Importance	Category	Task
79	Core	Administer compensation, benefits and performance management systems, and safety and recreation programs.
78	Core	Identify staff vacancies and recruit, interview and select applicants.
76	Core	Allocate human resources, ensuring appropriate matches between personnel.
73	Core	Provide current and prospective employees with information about policies, job duties, working conditions, wages, opportunities for promotion and employee benefits.
72	Core	Perform difficult staffing duties, including dealing with understaffing, refereeing disputes, firing employees, and administering disciplinary procedures.
72	Core	Advise managers on organizational policy matters such as equal employment opportunity and sexual harassment, and recommend needed changes.
71	Core	Analyze and modify compensation and benefits policies to establish competitive programs and ensure compliance with legal requirements.
70	Core	Plan and conduct new employee orientation to foster positive attitude toward organizational objectives.
69	Core	Serve as a link between management and employees by handling questions, interpreting and administering contracts and helping resolve work-related problems.
68	Core	Plan, direct, supervise, and coordinate work activities of subordinates and staff relating to employment, compensation, labor relations, and employee relations.
65	Core	Analyze training needs to design employee development, language training and health and safety programs.
64	Core	Maintain records and compile statistical reports concerning personnel-related data such as hires, transfers, performance appraisals, and absenteeism rates.
63	Core	Analyze statistical data and reports to identify and determine causes of personnel problems and develop recommendations for improvement of organization's personnel policies and practices.
62	Core	Plan, organize, direct, control or coordinate the personnel, training, or labor relations activities of an organization.
53	Core	Conduct exit interviews to identify reasons for employee termination.
78	Supplemental	Investigate and report on industrial accidents for insurance carriers.
70	Supplemental	Represent organization at personnel-related hearings and investigations.
68	Supplemental	Negotiate bargaining agreements and help interpret labor contracts.
58	Supplemental	Prepare personnel forecast to project employment needs.
57	Supplemental	Prepare and follow budgets for personnel operations.
51	Supplemental	Develop, administer and evaluate applicant tests.

Importance	Category	Task
50	Supplemental	Oversee the evaluation, classification and rating of occupations and job positions.
49	Supplemental	Study legislation, arbitration decisions, and collective bargaining contracts to assess industry trends.
47	Supplemental	Develop or administer special projects in areas such as pay equity, savings bond programs, day-care, and employee awards.
41	Supplemental	Provide terminated employees with outplacement or relocation assistance.
38	Supplemental	Contract with vendors to provide employee services, such as food service, transportation, or relocation service.

Table 4: Required tasks for Human Resources Managers (11-3040.00)

No.	Priority factor	Category	Task	Related to
1	22.616	Core	Direct and coordinate an organization's financial and budget activities in order to fund operations, maximize investments, and increase efficiency.	11-1011.00
2	21.845	Core	Confer with board members, organization officials, and staff members to discuss issues, coordinate activities, and resolve problems.	11-1011.00
3	21.804	Core	Administer compensation, benefits and performance management systems, and safety and recreation programs.	11-3040.00
4	21.588	Core	Analyze operations to evaluate performance of a company and its staff in meeting objectives, and to determine areas of potential cost reduction, program improvement, or policy change.	11-1011.00
5	21.528	Core	Identify staff vacancies and recruit, interview and select applicants.	11-3040.00
6	21.528	Supplemental	Investigate and report on industrial accidents for insurance carriers.	11-3040.00
7	20.976	Core	Allocate human resources, ensuring appropriate matches between personnel.	11-3040.00
8	20.560	Core	Direct, plan, and implement policies, objectives, and activities of organizations or businesses in order to ensure continuing operations, to maximize returns on investments, and to increase productivity.	11-1011.00
9	20.148	Core	Provide current and prospective employees with information about policies, job duties, working conditions, wages, opportunities for promotion, and employee benefits.	11-3040.00
10	20.046	Core	Prepare budgets for approval, including those for funding and implementation of programs.	11-1011.00
11	19.872	Core	Perform difficult staffing duties, including dealing with understaffing, refereeing disputes, firing employees, and administering disciplinary procedures.	11-3040.00
12	19.872	Core	Advise managers on organizational policy matters such as equal employment opportunity and sexual harassment, and recommend needed changes.	11-3040.00
13	19.789	Core	Direct and coordinate activities of businesses or departments concerned with production, pricing, sales, and/or distribution of products.	11-1011.00
14	19.789	Supplemental	Serve as liaisons between organizations, shareholders, and outside organizations.	11-1011.00
15	19.789	Supplemental	Review and analyze legislation, laws, and public policy, and recommend changes to promote and support interests of both the general population and special groups.	11-1011.00
16	19.596	Core	Analyze and modify compensation and benefits policies to establish competitive programs and ensure compliance with legal requirements.	11-3040.00
17	19.532	Core	Negotiate or approve contracts and agreements with suppliers, distributors, federal and state agencies, and other organizational entities.	11-1011.00
18	19.320	Core	Plan and conduct new employee orientation to foster positive attitude toward organizational objectives.	11-3040.00
19	19.320	Supplemental	Represent organization at personnel-related hearings and investigations.	11-3040.00
20	19.275	Core	Review reports submitted by staff members in order to recommend approval or to suggest changes.	11-1011.00
21	19.044	Core	Serve as a link between management and employees by handling questions, interpreting and administering contracts and helping resolve work-related problems.	11-3040.00
22	19.018	Core	Appoint department heads or managers, and assign or delegate responsibilities to them.	11-1011.00
23	19.018	Core	Direct human resources activities, including the approval of	11-1011.00

No.	Priority factor	Category	Task	Related to
			human resource plans and activities, the selection of directors and other high-level staff, and establishment and organization of major departments.	
24	18.768	Core	Plan, direct, supervise, and coordinate work activities of subordinates and staff relating to employment, compensation, labor relations, and employee relations.	11-3040.00
25	18.768	Supplemental	Negotiate bargaining agreements and help interpret labor contracts.	11-3040.00
26	18.247	Core	Preside over or serve on boards of directors, management committees, or other governing boards.	11-1011.00
27	17.990	Core	Prepare and present reports concerning activities, expenses, budgets, government statutes and rulings, and other items affecting businesses or program services.	11-1011.00
28	17.990	Supplemental	Nominate citizens to boards and commissions.	11-1011.00
29	17.940	Core	Analyze training needs to design employee development, language training and health and safety programs.	11-3040.00
30	17.733	Core	Establish departmental responsibilities, and coordinate functions among departments and sites.	11-1011.00
31	17.733	Core	Implement corrective action plans to solve organizational or departmental problems.	11-1011.00
32	17.733	Supplemental	Interpret and explain policies, rules, regulations, and laws to organizations, government and corporate officials, and individuals.	11-1011.00
33	17.664	Core	Maintain records and compile statistical reports concerning personnel-related data such as hires, transfers, performance appraisals, and absenteeism rates.	11-3040.00
34	17.476	Supplemental	Make presentations to legislative and other government committees regarding policies, programs, or budgets.	11-1011.00
35	17.388	Core	Analyze statistical data and reports to identify and determine causes of personnel problems and develop recommendations for improvement of organization's personnel policies and practices.	11-3040.00
36	17.219	Supplemental	Refer major policy matters to elected representatives for final decisions.	11-1011.00
37	17.219	Supplemental	Administer programs for selection of sites, construction of buildings, and provision of equipment and supplies.	11-1011.00
38	17.219	Supplemental	Direct and coordinate activities of businesses involved with buying and selling investment products and financial services.	11-1011.00
39	17.112	Core	Plan, organize, direct, control or coordinate the personnel, training, or labor relations activities of an organization.	11-3040.00
40	16.962	Core	Coordinate the development and implementation of budgetary control systems, recordkeeping systems, and other administrative control processes.	11-1011.00
41	16.705	Core	Direct non-merchandising departments such as advertising, purchasing, credit, and accounting.	11-1011.00
42	16.705	Supplemental	Direct and conduct studies and research on issues affecting areas of responsibility.	11-1011.00
43	16.448	Supplemental	Attend and participate in meetings of municipal councils and council committees.	11-1011.00
44	16.191	Core	Deliver speeches, write articles, and present information at meetings or conventions in order to promote services, exchange ideas, and accomplish objectives.	11-1011.00
45	16.008	Supplemental	Prepare personnel forecast to project employment needs.	11-3040.00
46	15.934	Supplemental	Organize and approve promotional campaigns.	11-1011.00
47	15.732	Supplemental	Prepare and follow budgets for personnel operations.	11-3040.00
48	15.677	Supplemental	Conduct or direct investigations or hearings to resolve complaints and violations of laws, or testify at such hearings.	11-1011.00
49	14.649	Supplemental	Represent organizations and promote their objectives at official functions, or delegate representatives to do so.	11-1011.00
50	14.628	Core	Conduct exit interviews to identify reasons for employee termination.	11-3040.00
51	14.299	Core	Monitor the facility to ensure that it remains safe, secure, and well-maintained.	11-3011.00
52	14.076	Supplemental	Develop, administer and evaluate applicant tests.	11-3040.00
53	13.937	Core	Direct or coordinate the supportive services department of a business, agency, or organization.	11-3011.00
54	13.937	Supplemental	Plan, administer and control budgets for contracts, equipment and supplies.	11-3011.00
55	13.800	Supplemental	Oversee the evaluation, classification and rating of occupations and job positions.	11-3040.00
56	13.524	Supplemental	Study legislation, arbitration decisions, and collective	11-3040.00

No.	Priority factor	Category	Task	Related to
			bargaining contracts to assess industry trends.	
57	13.394	Core	Set goals and deadlines for the department.	11-3011.00
58	13.524	Supplemental	Develop or administer special projects in areas such as pay equity, savings bond programs, day-care, and employee awards.	11-3040.00
59	12.851	Core	Prepare and review operational reports and schedules to ensure accuracy and efficiency.	11-3011.00
60	12.851	Supplemental	Oversee construction and renovation projects to improve efficiency and to ensure that facilities meet environmental, health, and security standards, and comply with government regulations.	11-3011.00

Table 5: The sixty most important tasks for incubator management

Table 5 includes the 60 prior tasks with the highest calculated priority factor; The Prior factor has been calculated, using the following formula:

$$\text{Priority factor} = \text{Similarity (\%)} * \text{Onet Importance number of each occupation}$$

In conclusion, the required tasks for incubator managers, stated in table 5, has been generally composed of the required tasks, related to the two most similar occupations, in reference to the ratings; namely Human resource management (Onet code: 11-3040.00) and chief executive (Onet code: 11-1011.00); few of the tasks related to the occupation Administrative service management (Onet code: 11-3011.00) has also been included. The other management occupations have not been considered due to their low Priority factor's value.

### Results of required skills for incubator management:

In order to achieve a fair result, first, the Similarity rate of "Other occupations" (1.1%) should be evenly distributed in other occupations values. The new values are shown in table 6.

Occupations	Onet Code	Similarity (%)
Administrative Services manager	11-3011.00	18.10183
Chief Executives	11-1011.00	25.70183
Financial Managers	11-3031.00	6.101833
General and Operations Managers	11-1021.00	12.70183
Human Resources Managers	11-3040.00	27.60183
Training & Development Managers	11-3042.00	8.701833

Table 6: New Similarity rate, caused by the distribution of the value of "Other occupations" in the six key Occupations, used as a reference

The Onet standard skill importance value for the six key reference occupations has been stated in table 7.

I	II	III	IV	V	VI	Skills Description
77	76	83	70	64	73	Active Learning – Understanding the implications of new information for both current and future problem-solving and decision-making.
78	90	86	82	92	86	Active Listening – Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
51	87	56	50	48	53	Complex Problem Solving – Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
82	92	71	68	48	68	Coordination – Adjusting actions in relation to others' actions.
72	92	80	67	68	81	Critical Thinking – Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
23	33	17	27	7	18	Equipment Maintenance – Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
33	58	16	44	18	48	Equipment Selection – Determining the kind of tools and equipment needed to do a job.
17	33	14	14	4	11	Installation – Installing equipment, machines, wiring, or programs to meet specifications.
75	60	88	66	68	90	Instructing – Teaching others how to do something.
65	99	83	77	63	75	Judgment and Decision Making – Considering the relative costs and benefits of potential actions to choose the most appropriate one.
49	84	79	63	63	74	Learning Strategies – Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.
70	96	55	73	46	57	Management of Financial Resources – Determining how money will be spent to get the work done, and accounting for these expenditures.
39	81	39	66	20	42	Management of Material Resources – Obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
71	81	88	81	89	89	Management of Personnel Resources – Motivating, developing, and directing people as they work, identifying the best people for the job.
60	70	84	58	52	54	Mathematics – Using mathematics to solve problems.
73	89	86	77	68	74	Monitoring – Monitoring/Assessing performance of your self, other individuals, or organizations to make improvements or take corrective action.
44	92	77	68	76	63	Negotiation – Bringing others together and trying to reconcile differences.
47	45	30	24	7	21	Operation and Control – Controlling operations of equipment or systems.
33	22	10	14	1	14	Operation Monitoring – Watching gauges, dials, or other indicators to make sure a machine are working properly.
36	68	43	44	27	42	Operations Analysis – Analyzing needs and product requirements to create a design.
41	81	71	70	65	79	Persuasion – Persuading others to change their minds or behavior.
33	23	6	11	0	0	Programming – Writing computer programs for various purposes.
25	48	43	56	27	26	Quality Control Analysis – Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
82	85	87	77	78	91	Reading Comprehension – Understanding written sentences and paragraphs in work related documents.
18	12	13	18	1	19	Repairing – Repairing machines or systems using the needed tools.
18	28	9	28	12	25	Science – Using scientific rules and methods to solve problems.
80	68	85	63	47	75	Service Orientation – Actively looking for ways to help people.
85	71	75	60	71	73	Social Perceptiveness – Being aware of others' reactions and understanding why they react as they do.
75	85	80	76	77	92	Speaking – Talking to others to convey information effectively.
35	57	42	38	18	35	Systems Analysis – Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
38	73	54	31	19	34	Systems Evaluation – Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.
18	51	8	25	10	21	Technology Design – Generating or adapting equipment and technology to serve user needs.
85	80	91	78	74	82	Time Management – Managing one's own time and the time of others.
33	53	63	49	14	21	Troubleshooting – Determining causes of operating errors and deciding what to do about it.
75	81	74	66	78	73	Writing – Communicating effectively in writing as appropriate for the needs of the audience.

**Table 7: The Skill requirements for the six key occupations and their Onet importance values;**

[I] Administrative Services manager (Onet code: 11-3011.00);

[II] Chief Executives (Onet coed: 11-1011.00);

[III] Financial Managers (Onet code: 11-3031.00);

[IV] General and Operations Managers (Onet Code 11-1021.00);  
 [V] Human Resources Managers ( Onet code: 11-3040.00);  
 [VI] Training & Development Managers (Onet code: 11-3042.00).

The importance value for the goal occupation (management of incubators) is calculated through the following two steps:

1. Every skill importance value (shown in table 7), related to an occupation should be multiplied by the Occupation similarity percentage, stated in table 6. The results the process has been shown in table 8.
2. The importance value for the goal occupation (Incubator management) in every skill is the summation of results of the first step, which has been shown with  $\Sigma$  in table 8.

Column  $\Sigma$  in table 8 shows the calculated importance value for each required skill.

$\Sigma$	I	II	III	IV	V	VI	Skill Description
85.79	14.11	23.13	5.24	10.41	25.39	7.48	Active Listening – Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
81.63	12.85	20.81	5.36	10.28	24.56	7.74	Management of Personnel Resources – Motivating, developing, and directing people as they work, identifying the best people for the job.
81.22	14.84	21.84	5.30	9.78	21.52	7.91	Reading Comprehension – Understanding written sentences and paragraphs in work related documents.
79.21	13.57	21.84	4.88	9.65	21.25	8.00	Speaking – Talking to others to convey information effectively.
78.96	15.38	20.56	5.55	9.90	20.42	7.13	Time Management – Managing one's own time and the time of others.
76.32	13.21	22.87	5.24	9.78	18.76	6.43	Monitoring – Monitoring/Assessing performance of your self, other individuals, or organizations to make improvements or take corrective action.
75.97	11.76	25.44	5.06	9.78	17.38	6.52	Judgment and Decision Making – Considering the relative costs and benefits of potential actions to choose the most appropriate one.
75.88	13.03	23.64	4.88	8.51	18.76	7.04	Critical Thinking – Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
75.17	13.57	20.81	4.51	8.38	21.52	6.35	Writing – Communicating effectively in writing as appropriate for the needs of the audience.
71.78	15.38	18.24	4.57	7.62	19.59	6.35	Social Perceptiveness – Being aware of others' reactions and understanding why they react as they do.
71.44	13.93	19.53	5.06	8.89	17.66	6.35	Active Learning – Understanding the implications of new information for both current and future problem-solving and decision-making.
71.40	7.96	23.64	4.69	8.63	20.97	5.48	Negotiation – Bringing others together and trying to reconcile differences.
70.62	14.84	23.64	4.33	8.63	13.24	5.91	Coordination – Adjusting actions in relation to others' actions.
69.35	13.57	15.42	5.36	8.38	18.76	7.83	Instructing – Teaching others how to do something.
67.63	12.67	24.67	3.35	9.27	12.69	4.96	Management of Financial Resources – Determining how money will be spent to get the work done, and accounting for these expenditures.
67.11	8.86	21.58	4.82	8.00	17.38	6.43	Learning Strategies – Selecting and using training/instructional methods and procedures appropriate for the situation when learning or teaching new things.
66.27	7.42	20.81	4.33	8.89	17.94	6.87	Persuasion – Persuading others to change their minds or behavior.
64.64	14.48	17.47	5.18	8.00	12.97	6.52	Service Orientation – Actively looking for ways to help people.
60.39	10.86	17.99	5.12	7.36	14.35	4.69	Mathematics – Using mathematics to solve problems.
59.22	9.231	22.36	3.417	6.35	13.24	4.61	Complex Problem Solving – Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
47.81	7.05	20.81	2.37	8.38	5.52	3.65	Management of Material Resources – Obtaining and

$\Sigma$	I	II	III	IV	V	VI	Skill Description
							seeing to the appropriate use of equipment, facilities, and materials needed to do certain work.
43.31	6.51	17.47	2.62	5.58	7.45	3.65	Operations Analysis – Analyzing needs and product requirements to create a design.
41.07	6.87	18.76	3.29	3.93	5.24	2.95	Systems Evaluation – Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.
36.59	5.97	14.90	0.97	5.58	4.96	4.17	Equipment Selection – Determining the kind of tools and equipment needed to do a job.
36.38	6.33	14.65	2.56	4.82	4.96	3.04	Systems Analysis – Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
36.31	4.52	12.33	2.62	7.11	7.45	2.26	Quality Control Analysis – Conducting tests and inspections of products, services, or processes to evaluate quality or performance.
35.35	5.97	13.62	3.84	6.22	3.86	1.82	Troubleshooting – Determining causes of operating errors and deciding what to do about it.
28.71	8.50	11.56	1.83	3.04	1.93	1.82	Operation and Control – Controlling operations of equipment or systems.
24.61	3.25	13.10	0.48	3.17	2.76	1.82	Technology Design – Generating or adapting equipment and technology to serve user needs.
20.61	4.16	8.48	1.03	3.42	1.93	1.56	Equipment Maintenance – Performing routine maintenance on equipment and determining when and what kind of maintenance is needed.
20.04	3.25	7.19	0.54	3.55	3.31	2.17	Science – Using scientific rules and methods to solve problems.
16.25	3.07	8.48	0.85	1.77	1.10	0.95	Installation – Installing equipment, machines, wiring, or programs to meet specifications.
15.51	5.97	5.65	0.61	1.77	0.27	1.21	Operation Monitoring – Watching gauges, dials, or other indicators to make sure a machine are working properly.
13.64	5.97	5.91	0.36	1.39	0	0	Programming – Writing computer programs for various purposes.
11.35	3.25	3.08	0.79	2.28	0.27	1.65	Repairing – Repairing machines or systems using the needed tools.

**Table 8: Required skills for the key reference occupations and the goal occupation**

- [I] Contribution factor for skills related to Administrative Services management (Onet code: 11-3011.00);  
 [II] Contribution factor for skills related to Chief Executives (Onet coed: 11-1011.00);  
 [III] Contribution factor for skills related to Financial Management (Onet code: 11-3031.00);  
 [IV] factor for skills related to General and Operations Management (Onet Code 11-1021.00);  
 [V] factor for skills related to Human Resources Management (Onet code: 11-3040.00);  
 [VI] factor for skills related to Training & Development Management (Onet code: 11-3042.00).  
 [ $\Sigma$ ] the summary of items I, II, III, IV, V, VI which concludes the skills Importance value for incubator management.

## Personality Code of Incubator managers

The following table contains the Personality codes for each occupation and has been derived by the similar methods used in the previous section.

Occupation	Code
Administrative Services Management	ECS
Chief Executive	ECS
Financial Management, Branch or Department	ECS
General and Operations Management	Not stated
Human Resources Management	ESC
Training and Development Management	ESC
Incubator Management	ECS

**Table 9: Personality codes for key management occupations.**

## Phase 3- Comparing the results of Phase 1 and 2:

The comparison of the Phases 1 and 2 resulted that:

1. All of the tasks written by the five successful incubator managers were included in the sixty most important tasks (table 8).

2. The priority of required skills is nearly 80% similar to the information gathered in the interview.
3. The priority of Listening skills has been higher than Reading, speaking and writing in view of the five successful managers.
4. The personalities of the five interviewed successful incubator managers were truly estimated ECS.
5. All of the interviewed incubator managers also believed themselves as Chief Executives and Human Resource managers.

### Conclusion:

In this paper we have analyzed the job of incubators managers, and the following details were derived:

1. In choosing and hiring managers for incubators, more attention should be paid to nature of this job and the characteristic of the candidates. Policy makers could also design and run various effective training programs to improve incubators manager's abilities and performance.
2. The characteristics of the occupation, "Incubator management" could be comprehended by studying similar Management occupations, namely "Human resource management", "Chief Executive", and "Administrative services management", etc (as stated in tables 7 and 8).
3. The Personality type of a successful incubator manager is ECS (Enterprising, Conventional, and Social); thus it is urgent for an incubator manager to be an assist, a Persuader, and an organizer.

It is also considering that the estimated skills, tasks, and interests of the occupation, "incubator management", in the current research are results of a local study and in order to achieve a global standard result, further studies must be performed in different locations and countries, with a vast majority of participation of incubator managers.

### Acknowledgement

The authors would like to thank Business Modeling Research Group in ACECR for their effort to collect and process the required information.



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