INTERNET OF THINGS FOR EUROPEAN SMALL AND MEDIUM ENTERPRISES

Erasmus+

IoT4SMEs

INTERNET OF THINGS FOR EUROPEAN SMALL AND MEDIUM ENTERPRISES

Project Number: 2016-1-IT01-KA202-005561

Training needs and professional skills analysis

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Contents

1 Introduction

1.1 Project Description

Internet of Things (IoT) is widely considered as the next step towards of the digital society, where objects and people are interconnected and interact through communication networks. IoT not only has a huge social impact, but can also support the employability and boost the competitiveness of European companies. It is widely considered as one of the most important key drivers for the implementation of the so-called Industry 4.0 and for the digital transformation of the companies. Relevant impact of this technology is expected in a wide range of sectors. In March 2015 the European Commission has launched the Alliance for Internet of Things Innovation (AIOTI) to closely work with all the stakeholders and actors of the IoT sector at European level. Then, always in 2015 has adopted the Digital Single Market strategy, of which a pillar is "digital as a driver for growth". In line with the European policies on IoT and fostering the Digital Single Market pillar, the IoT4SMEs proposal pursues the main objective of:

- qualifying new professionals able to support the digital transformation of the European companies exploiting to the advantages offered by the IoT technology.

This objective is reached by pursuing the specifically objectives of:

- raising awareness among European Small and Medium Enterprises of the IoT technologies and applications and of the potential benefits for their competitiveness and economical growth;
- creating VET qualifications for professionals inside European Companies, enhancing their digital competences and training them to introduce and manage IoT technologies and applications.

In order to realize these objectives, the IoT4SMEs partnership has been set-up. It involves 9 partners coming from 6 different countries (France, Germany, Italy, Lithuania, Portugal, Spain). The partners are 4 HEIs, 2 technological parks, 1 network of companies, 1 consultancy company and 1 expert of VET qualifications. The partnership ensures a very good geographical coverage and brings into the project complementary competences.

The project will be realized in 36 month. At first, after assessing the IoT actual uses and future trends, an analysis of the labour marker will be performed in order to identify the most required competences and the gap of knowledge. This will lead to the design of VET qualification related to IoT, designed according to the European Lifelong Learning instruments (EQF, ECVET and EQAVET). Therefore, all the next training activities will be enclosed in framework that will allow the transparent recognition and transferability of the competences at European level.

The target groups (companies, professionals, IoT developers and users, researchers, students) will be able to access the training courses at distance by means of the project web-platform. Additionally, interviews and showcases will be produced, in order to give a concrete evidence of IoT applications and technologies. Then, in order to allow the student to acquire also practical competences, highly innovative didactic demonstrators on IoT will be developed. The instruments, working as remote laboratories, will allow the students to make practical experiences with IoT technologies, complementary to the ones acquired in the distance learning courses.

The project will directly impact on the European companies, in terms of staff members trained and qualified to use IoT technologies and applications, on the professionals that will improve their skills and their employability, on the European Universities and VET providers, in terms of enhanced didactic offer in the IoT sector. The IoT4SMEs qualifications, designed using the ECVET instrument, will allow the transnational recognition of the acquired competences and will enhance the employability of the qualified users at European level. The project long terms benefit will be to speed up and increase the use of IoT across all

economic sectors, fostering the European economy grow thanks to the digitalization transformation of the corporate sector. This perfectly match a pillar of the European Digital Single Market strategy.

1.2 Objectives of Intellectual Output 1

The output consists of two reports that are the basis for the development of the other project activities.
The first document consists of an analysis of the IoT state of art at European level. It will include at least: - an analysis of the different available providers, technologies and applications connected to IoT, as well as future trends; - an analysis of the awareness of the existing IoT technologies and applications in the corporate sectors. The document aims to provide a clear picture of the actual (and foreseen, where possible) IoT world, in terms of applications and technologies. This will help the partnership to identify, among the several field of application of IoT, the ones with a higher potential for the business sector of for the employability of the professionals. Then, it will also help the professionals trained in the project to have a support, providing them practical information of the uses of IoT technologies. The second document consists of an analysis of the professional skills required in the area of IoT and an analysis of the labour market actual situation and prospective of employability. The analysis will be mainly carried out a national and European level, however taking into account the global trends too. This will help the partnership to identify the gaps of skills to be filled. These two documents will jointly contribute to the next identification of the sectors where to focus the qualifications and the training courses, as well as the contents of the modules of the training courses.

Activity O1/A1 – Assessment methodology

This activity aims to define the strategy to be implemented for the analysis of the IoT state of art and of the professional skills required in the labour market. The items to be covered for the analysis are at least:
- questionnairies submitted through the web
- interviews and contacts with stakeholders and experts of IoT
- existing sector studies, publications and reports at national and international levels.

The activity will define the formats of the questionnaires and the strategies to deliver them in an efficient way, the modalities to perform the interviews, any suggestion regarding other possible sources of information.

Activity O1/A2 – National, European and Global labour market analysis

Evaluating skills required by the labour market is essential in the build-up of the training process, defined by experts in the academic and corporate sector. The analysis will play an important role to promote the effective employability of the trainees. What is more, a proper needs and skills evaluation overlapping with the state of the art assessment will favour a tailor-made learning process mirroring the chosen researchers' own competences. At a more general level, this evaluation will assess the overall initiative efficiency, while translating progress in terms of users' acquired competences and skills. The analysis will be performed by means of online surveys, interviews and/or meetings with companies and experts in the sector. As result of the investigation, the characteristics of the existing and wished competences in the labour market will emerge. This will allow designing the next outputs (qualifications, training courses, etc.).

Activity O1/A3 - IoT diffusion at national and European level

The activity is related to an investigation of the IoT state of art and its adoption at national and European level. First of all, already existing studies and analyses on IoT state of art will be collected and analysed. A research will be also carried out in order to collect other studies and analyses already performed in research projects not involving members of the partnership. Then, all partners will use these initial results in order to research the IoT actual use and potential for businesses. The research will be performed by means of assessment instruments (interviews and/or surveys) designed by activity coordinator and used by all the partners. This research is adamant in order to justify the need for the training. It is also functional to have a

clear overview of the existing and foreseen IoT technologies. The final output, collecting all the found services and technologies, will be also an aid for all the professionals interested to deal with the IoT world.

2 Research Methodology

The use approaches for the analysis of Internet of Things (IoT) and of the professional skills required in the labour market are:

- Questionnaires submitted through the web completed with short interviews
- Existing sector studies, publications and reports at national and international level
- In order to interview companies through the web, IAT developed a first draft of survey.
- The survey contains twenty questions about general company information, Internet of Things usage/development and depending on profile, the necessity of trainings for competence improvement in order to develop/use IoT. In particular, the questions are:

Q1: In which country do you work?

Q2: How many employees work in your company?

Q3: In which sector does your business/organization operate?

Q4: What is your job role?

Q5: Are you interested in Internet of Things (IoT) for your business/organization?

Q6: Are you familiar with Internet of Things (IoT)?

Q7a: In which domain would you be interested in developing knowledge/skills about Internet of Things (IoT)?

Q7b: According to you, what best defines the Internet of Things (IoT)? (choose from 1 to 4 answers only)

Q8: Do you use/develop „Internet of Things“ (IoT) in your business/organization?

Q9: What kind of IoT do you use/develop with your business/organization?

Q9b: Why don’t you use/develop IoT in your business/organization?

Q10: What kind of activity/projects related to „Internet of Things“ are you involved in?

Branching depending on profile (job role):

Director, Manager, Designer

Q11: Do you think that the following competences are relevant when designing and implementing IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed)

Q12: Do you have personal needs to develop the following competences in order to manage IoT-project? (rate your needs from 0 till 4: 0 no needs; 4 highly needed):

Q13: How do you judge the IoT concerning the achievment of future business outcomes within your own organization?

Q14: Are you willing to benefit from training provisions in order to manage IoT-projects?

IT or ICT staff

Q15: Do you have personal needs to improve skills or competences in order to develop IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed):

Q16: Are you willing to benefit from training provisions in order to develop IoT-projects?

Q17a: Which more specific training do you need in „Hardware“ domain?

Q17b: Which more specific training do you need in „Operating System for Embedded Systems“ domain?

Q17c: Which more specific training do you need in „Communication, Network and Protocols“ domain?

Q17d: Which more specific training do you need in „Mobile Computing“?

Q17e: Which more specific training do you need in „Distributed Architecture“?

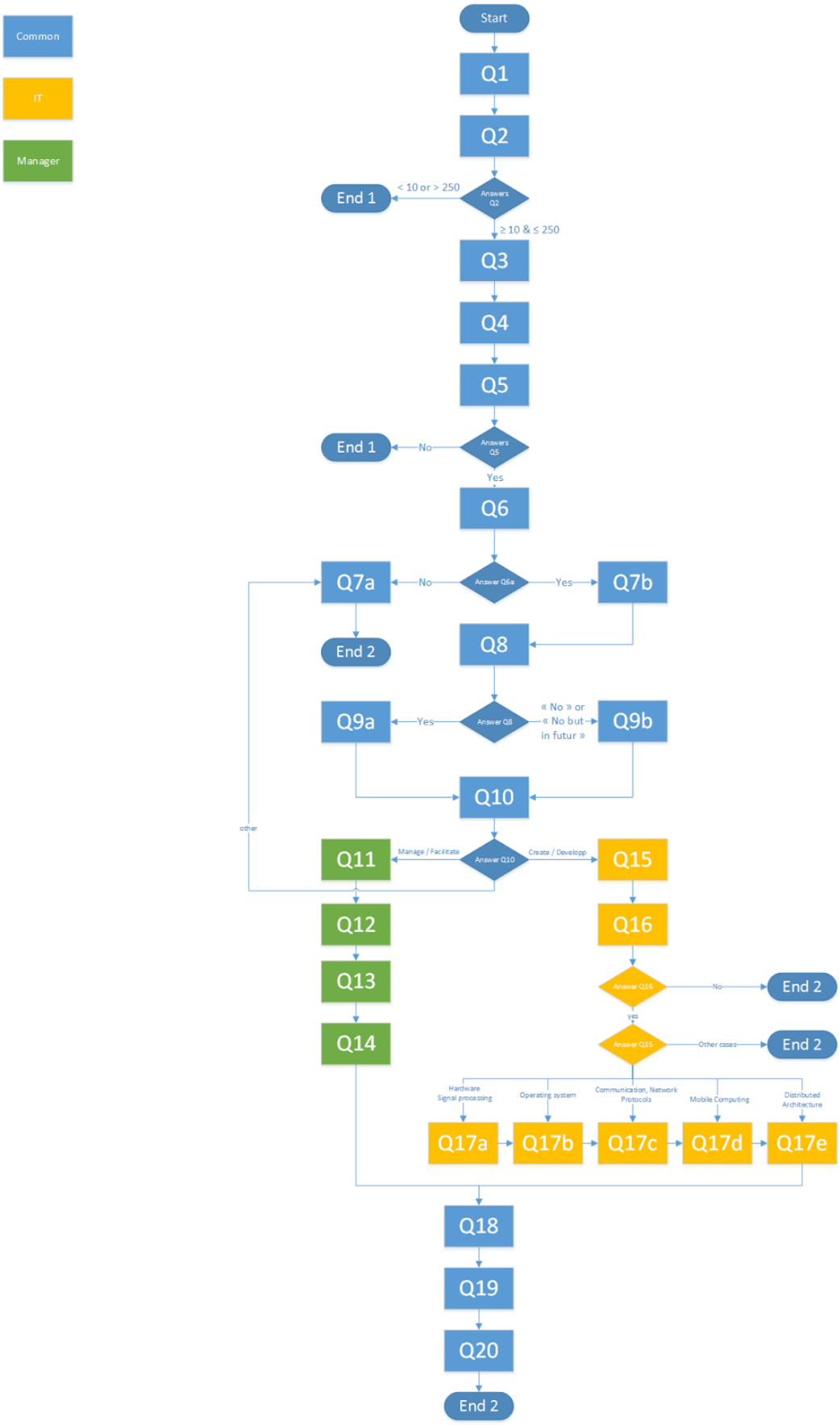
Q18: Where do you see the biggest advantages to leveraging the IoT within your organization?

Q19: Please state at least three commercial IoT applications in the vicinity of your own organization. Use Product names; example: rule-based analysis of production data based on BOSCH – IoT-Suite Embedded systems

Q20: The European Union supports the commercial adoption of the IoT by several programs. Did your organization participate in one of these programs?

To conduct the survey, regarding Internet of Things usage and implementation in small and medium enterprises and necessary skills as well as competences for employees, were selected six European countries, according to IoT4SMEs project participants location. Due to different spoken languages, the initial English questionnaire version was translated in Portuguese, Spanish, French, Italian, German, and Lithuanian languages (See Annex). In order to better facilitate and represent the results, the generalised data is indicated in charts and diagrams in English.

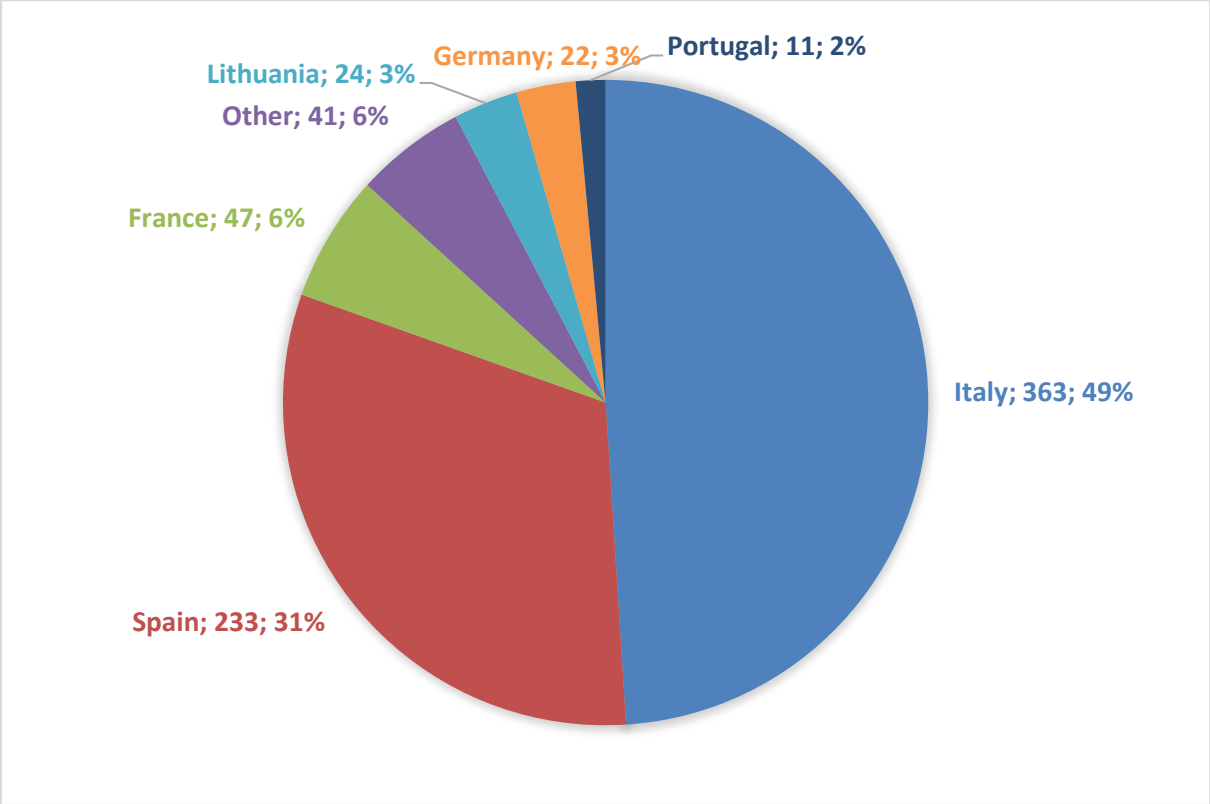
Chart flow oft he organisation oft he questions in the survey



3 European Survey on Internet of Things

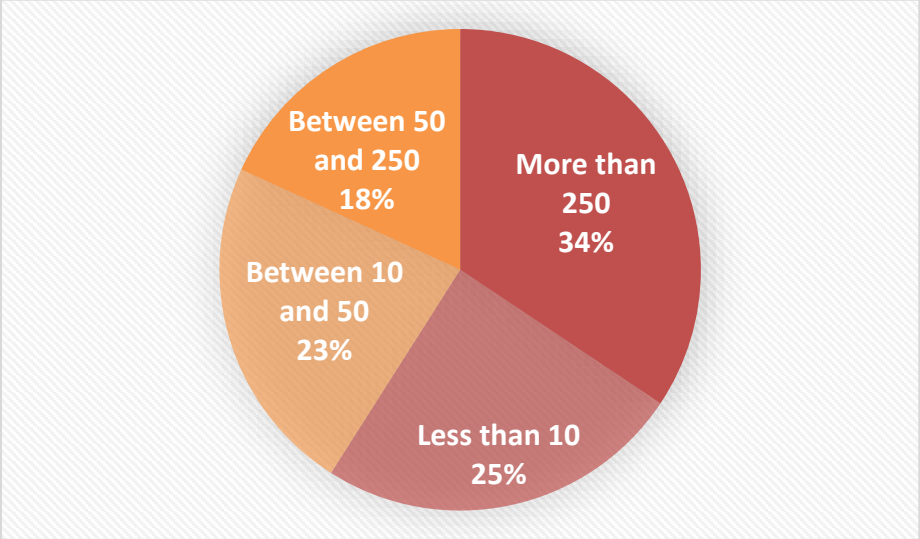
Getting to know the profile of respondents

Q1 : In which country do you work ?



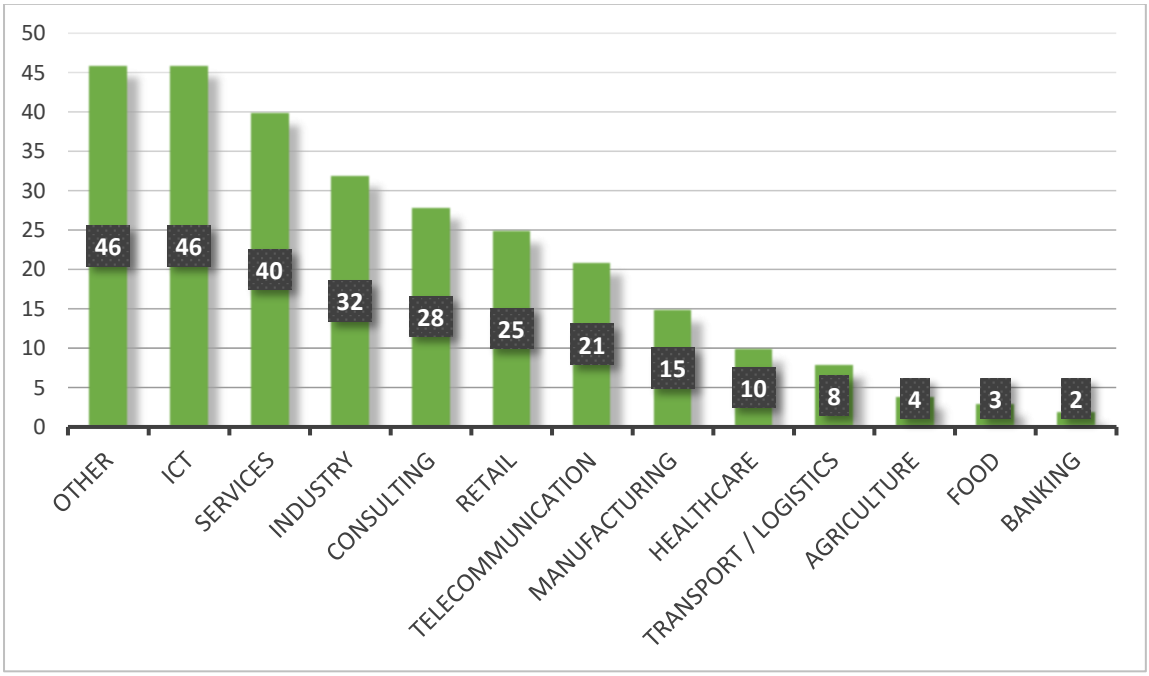
800 companies answered. 580 companies answered till the end of the questionnaire, 220 gave partial answers.
Companies from Italy and Spain are the most represented respondants in this questionnaire.

Q2: How many employees work in your company?



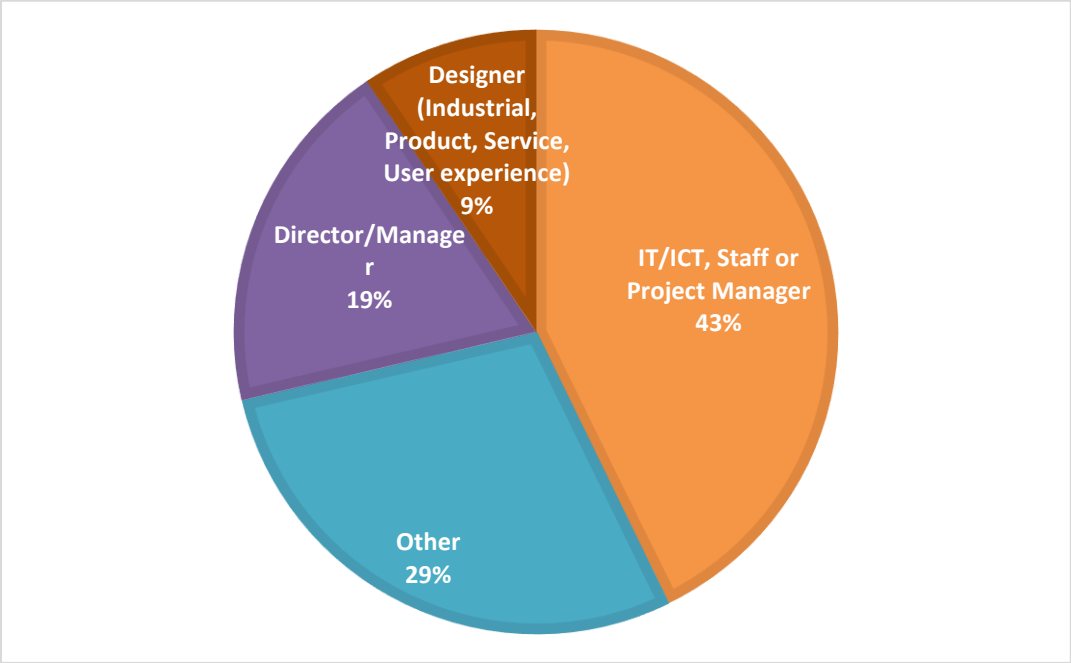
42% of the companies that answered are Small and Medium Enterprises, which is the target group of the project IoT4SMEs. Consequently, 42% of the total answers will be analyzed for the design and implementation of the training courses about Internet of Things.

Q3: In which sector does your business/organization operate?



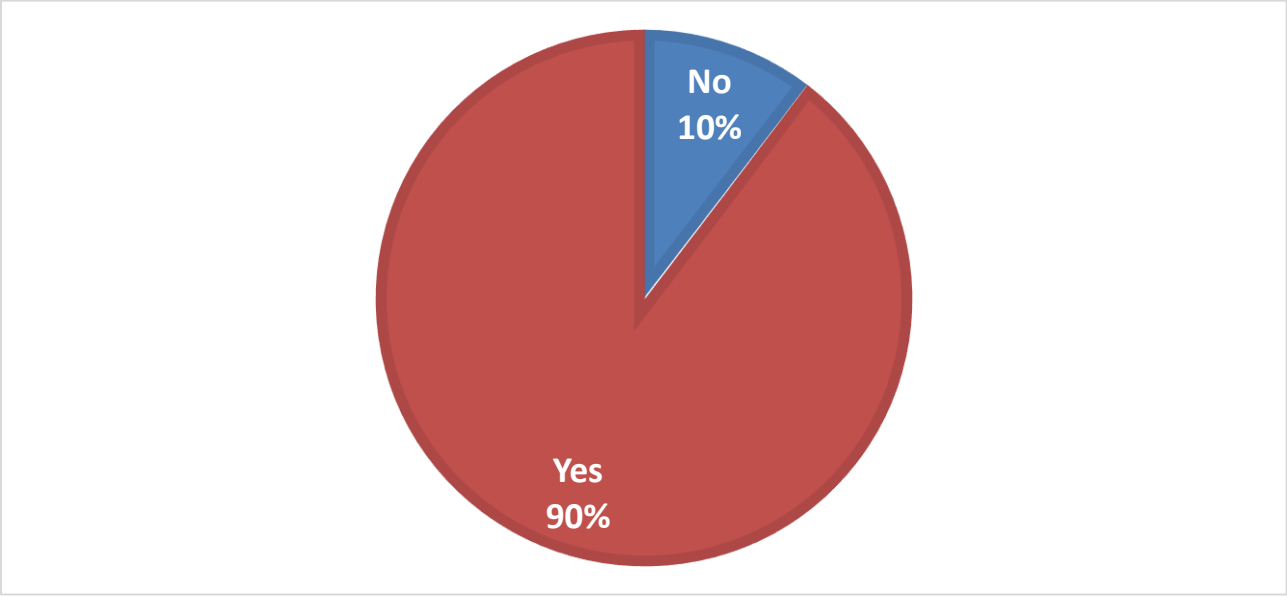
The most represented sector is « Other » (46%) with a predilection for the « Education » sector.

Q4: What is your job role?



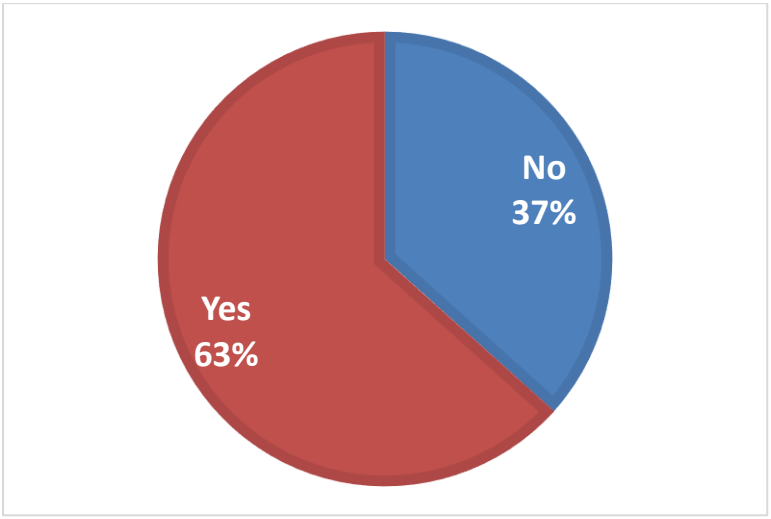
IT/ICT staff and project managers is the most represented job role among the respondants (43%).
The managerial function is little represented (« Director /Manager »(19%)) and the « Designe »r one even less (9%). Consequently It might reveal that among the contacted companies, the respondants are more technique-oriented.

Q5: Are you interested in Internet of Things (IoT) for your business/organization?



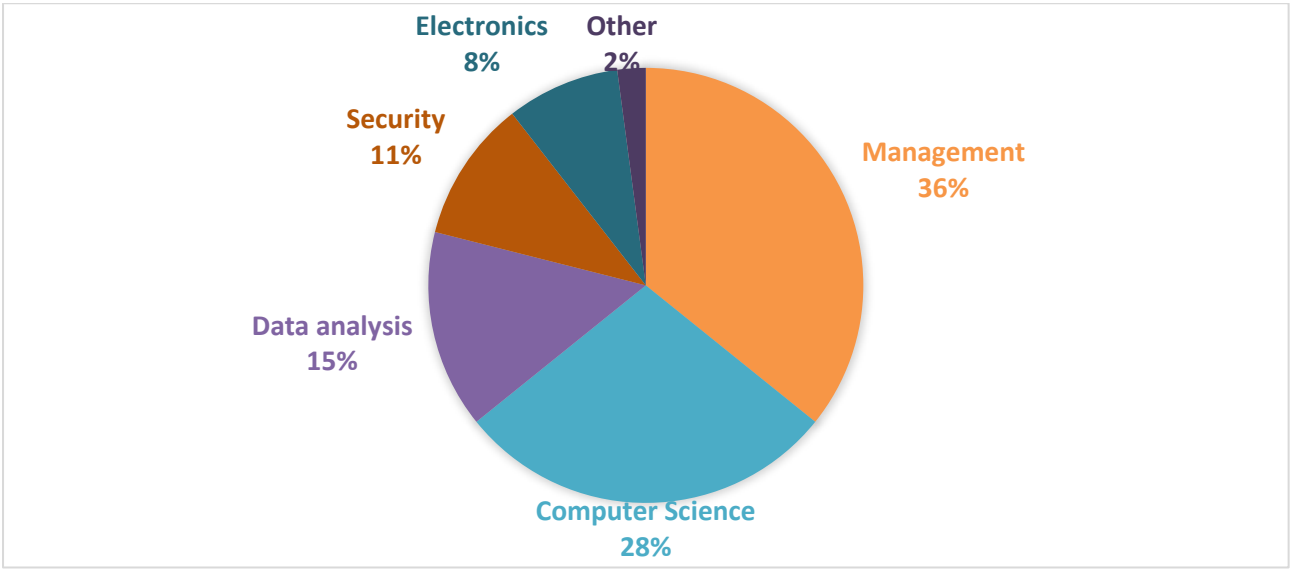
90% of companies are interested in the topic “Internet of Things”.

Q6: Are you familiar with Internet of Things (IoT)?



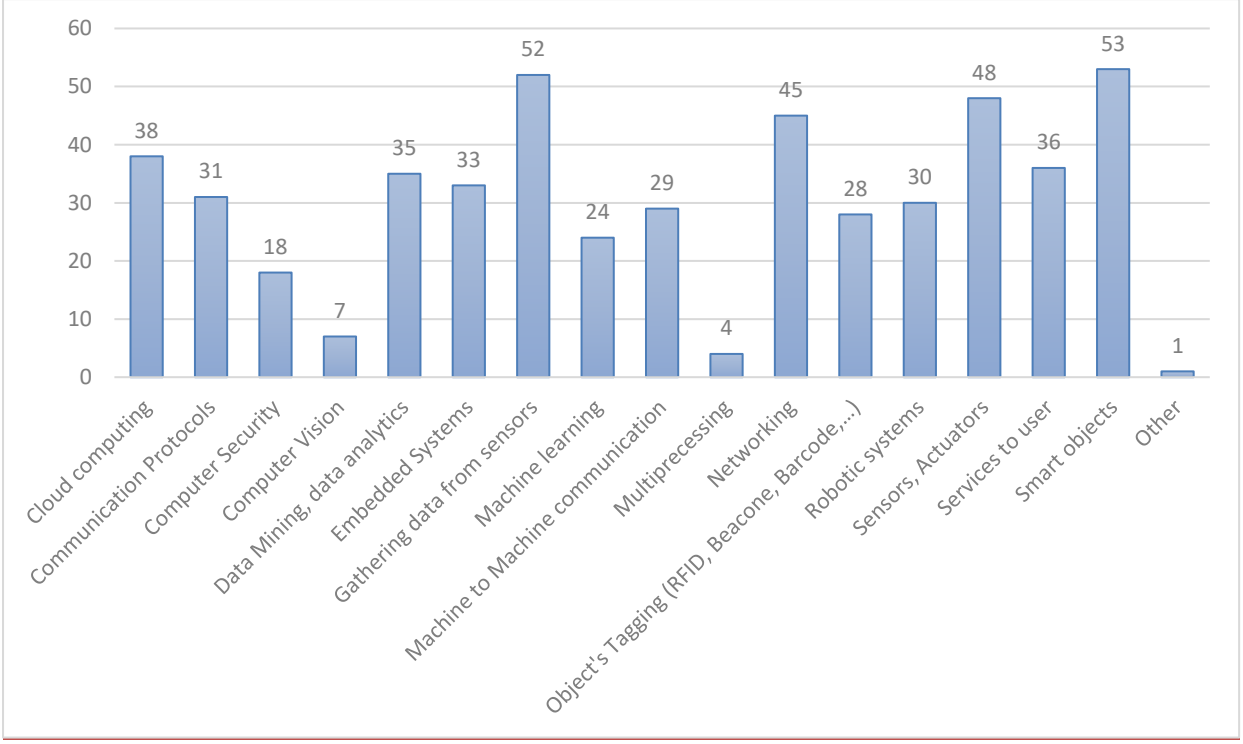
63% of the companies who responded are interested in the topic of Internet of Things.

Q7a: In which domain would you be interested in developing knowledge/skills about Internet of Things (IoT)? (choose from 1 to 4 answers only)



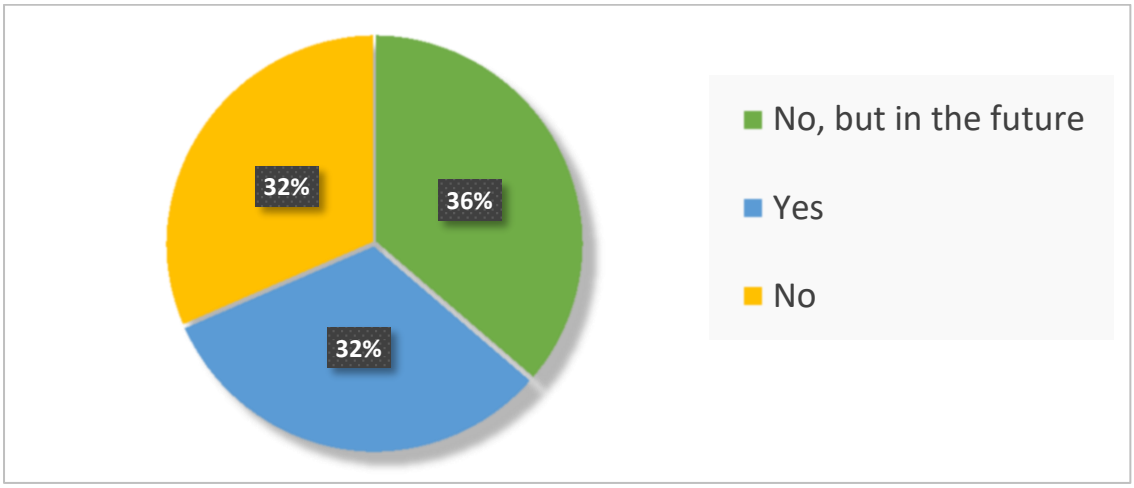
The answers of 146 companies were analyzed for this question with 1 to 4 answers/choices.
The domain in which companies would be the most interested in developing skills and knowledge about IoT is « Management » (36 %), « Computer Science » (28%), and « Data Analysis » (15%). It can be related to general, technical and macro-level skills about IoT.

Q7b: According to you, what best defines the Internet of Things (IoT)? (choose from 1 to 4 answers only) 146 answers with 1 to 4 answers/choices



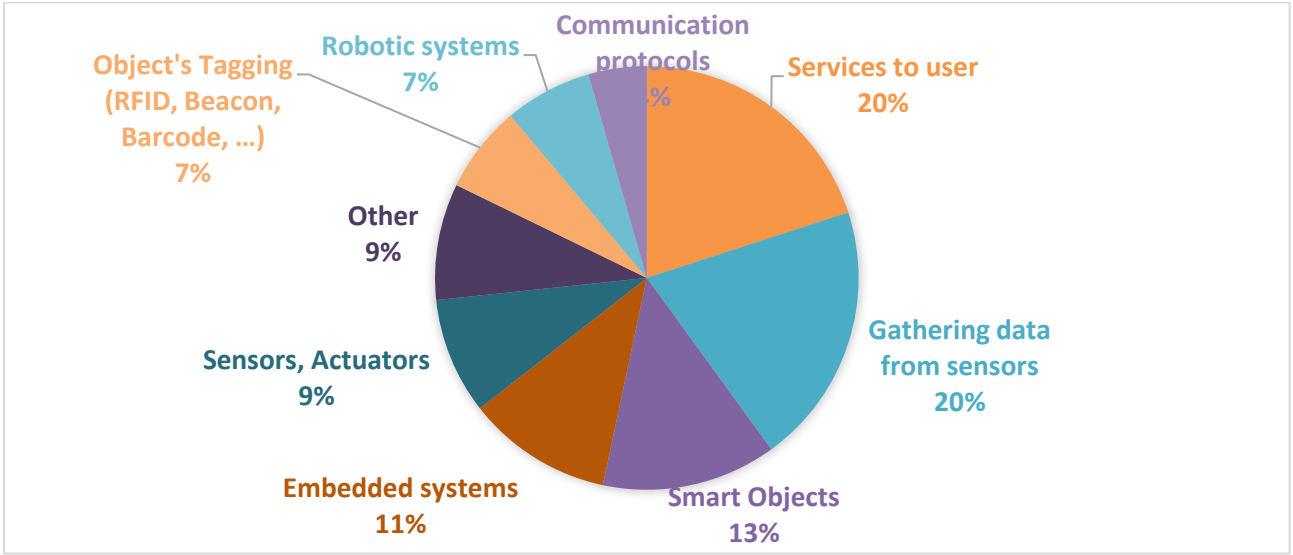
According to the respondents, gathering data from sensors (52%) and smart objects (53%) best defines Internet of Things. Moreover, respondents highly relates sensors and actuators (48%), also networking (45%) to the IoT. Approximately 38% of respondents considers IoT as Cloud computing and 31% as communication protocols. However, less than 30% response options were selected, when relating IoT with computer vision, machine learning, computer security (18%) and multiprocessing (4%).

Q8: Do you use/develop "Internet of Things" (IoT) in your business/organization?

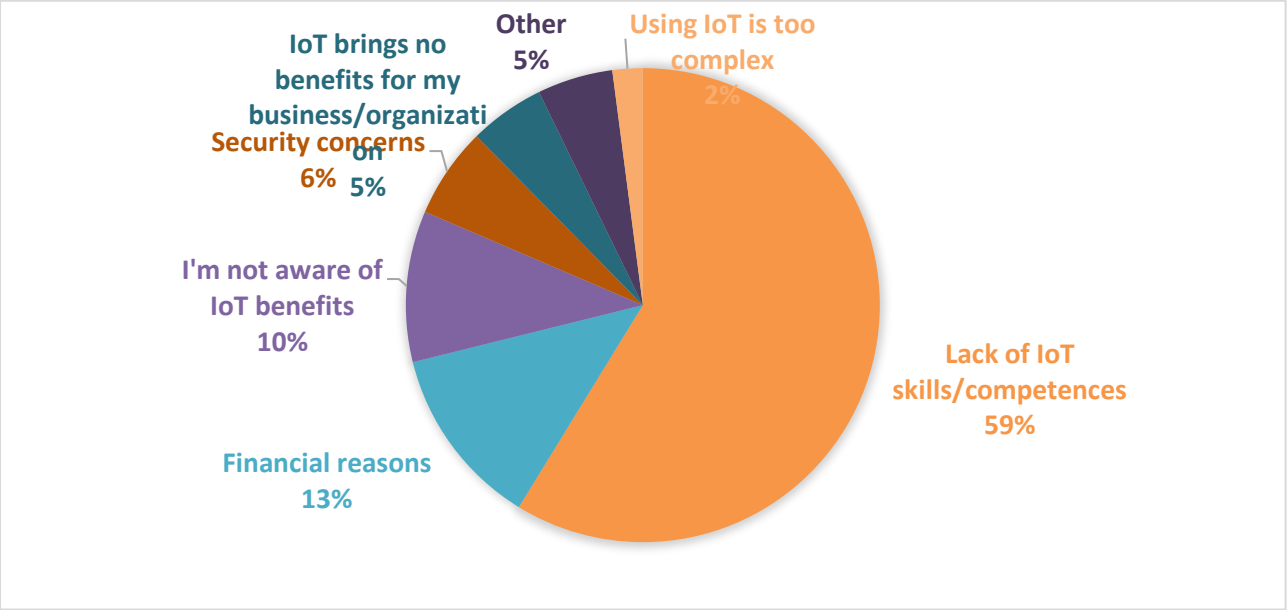


36% of the respondants do not use/develop IoT but intend to do so in the future, 32% uses/develops IoT, and 32% do not use/develop IoT and do not plan to do so in the future.

Q9a: What kind of IoT do you use/develop with your business/organization?

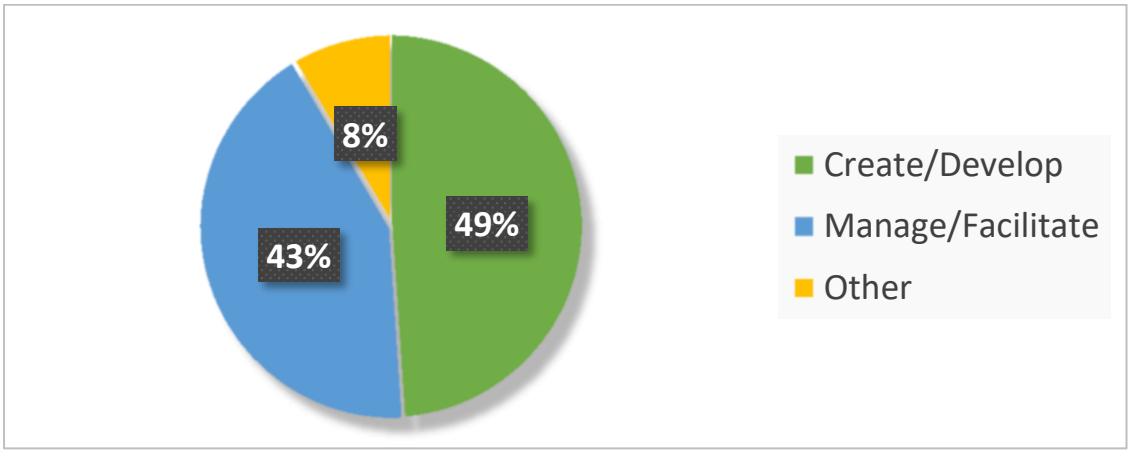


Q9b: Why don't you use/develop IoT in your business/organization?



For the respondants, the main reason for not using or developing IoT is clearly a lack of skills and competences in IoT which is very positive with respect to the objectives of the project. Nonetheless this result has to be put in perspective with answers to question Q4 that highlight that respondants are mostly technique-oriented. That might reveal a need also in attending training courses that would focus on more general information about what are IoT and what are their benefits for a business or an organization.

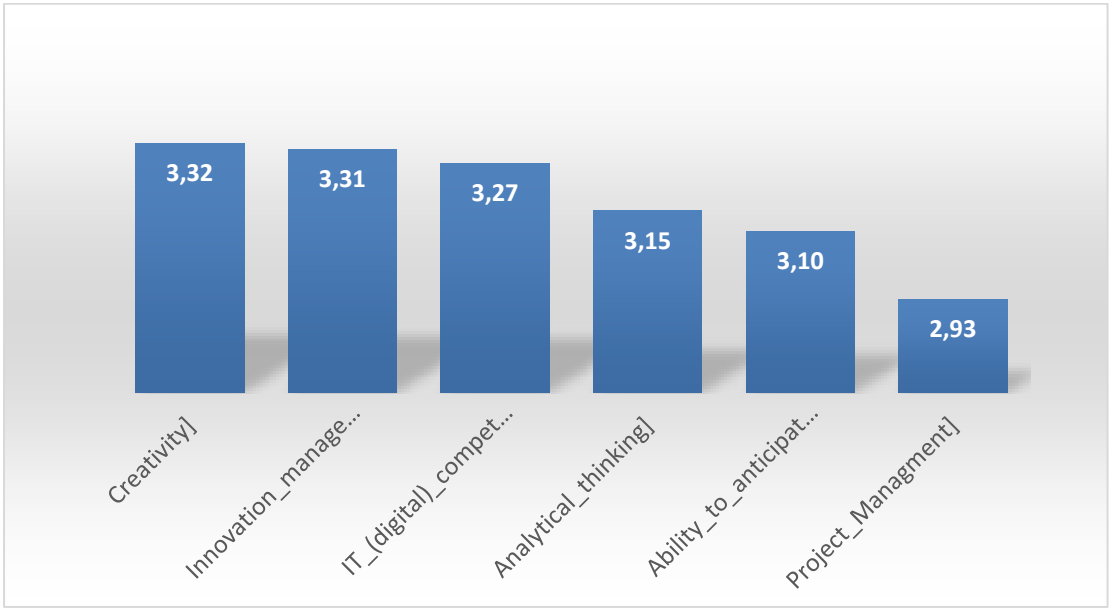
Q10: What kind of activity / projects related to "Internet of Things" are you involved in?



<u>Branching depending on profile (job role)</u>

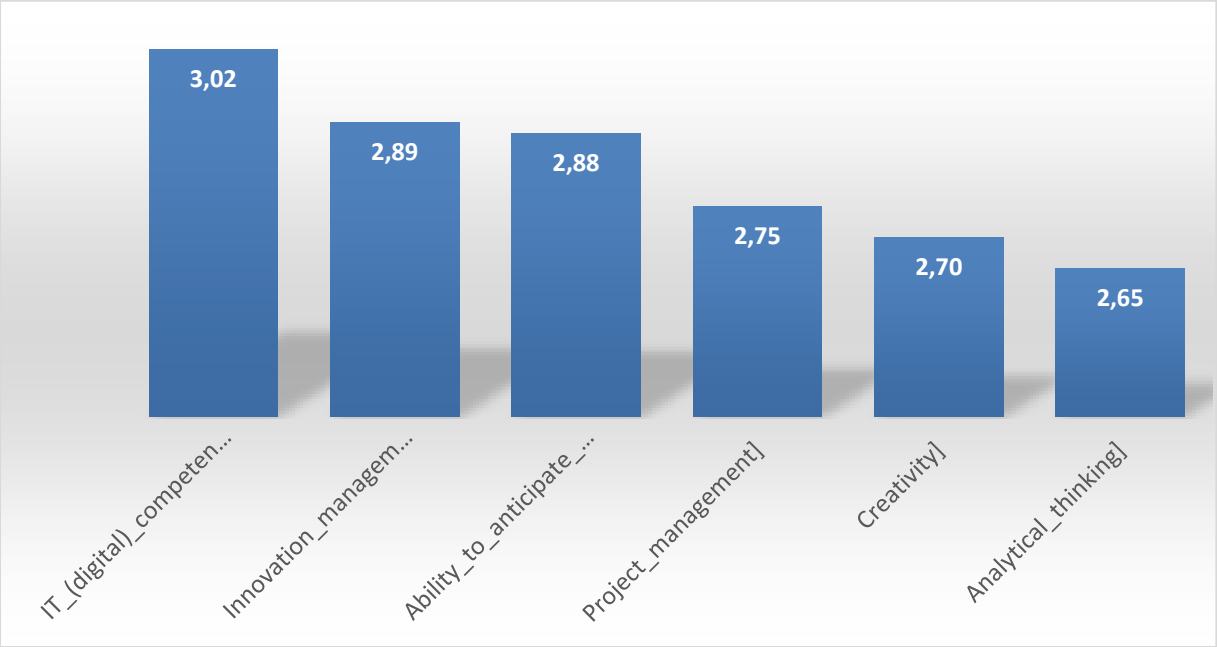
Director, Manager, Designer

Q11: Do you think that the following competences are relevant when designing and implementing IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed)



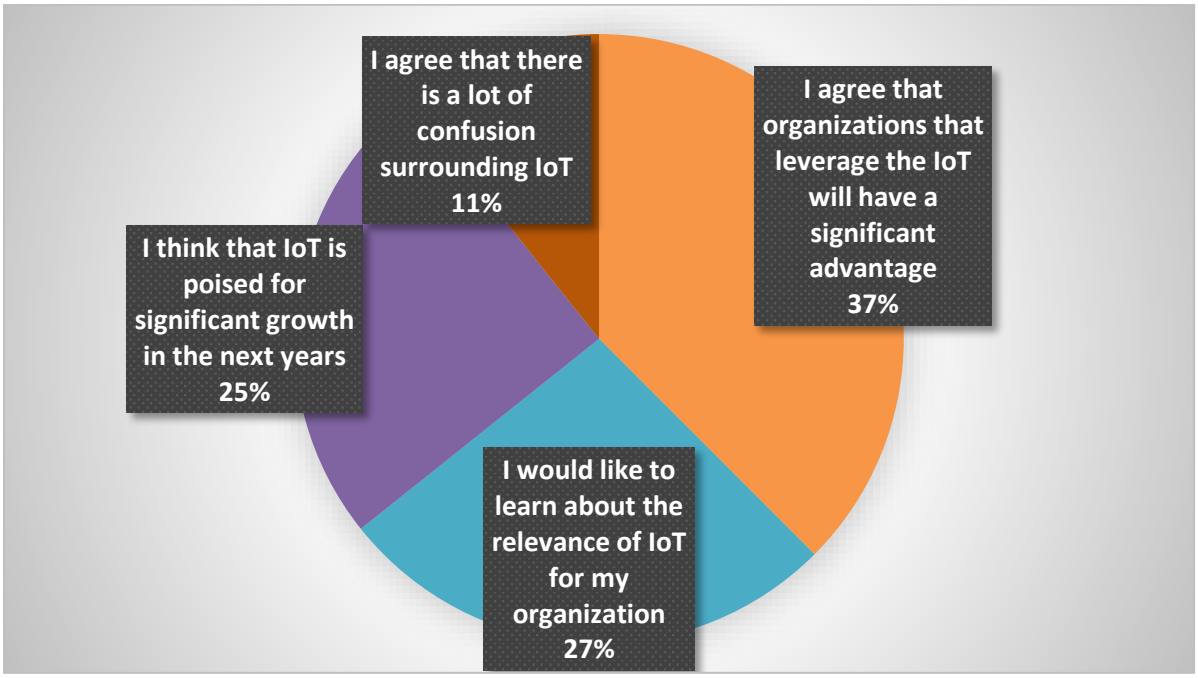
The answers from 59 companies were analyzed. The calculated ratio for those answers rated from 0 to 4 are the following ones : according to the respondants, the most relevant competencies when designing and implementing IoT projects are « Creativity » (3,32), « Management of innovation » (3,31), and « IT (digital) competencie » (3,27).

Q12: Do you have personal needs to develop the following competences in order to manage IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed)



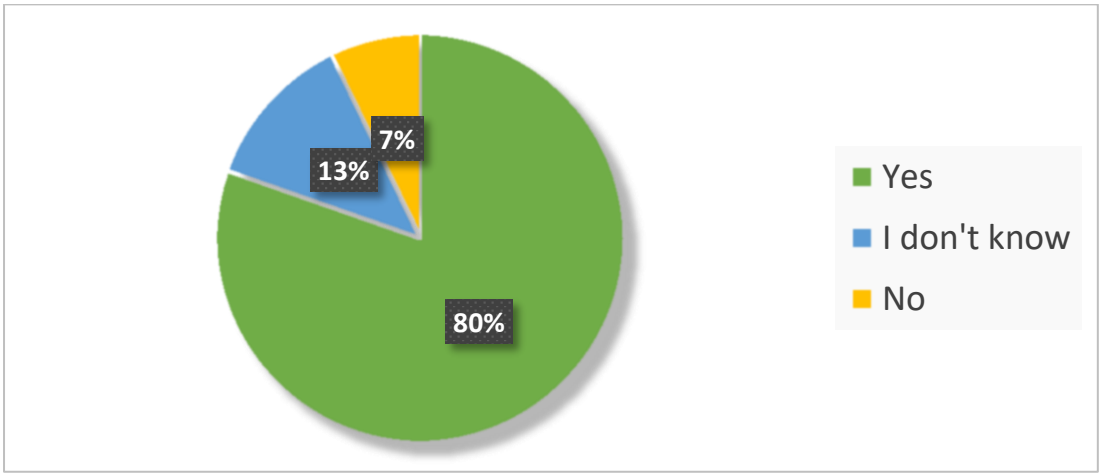
The answers from 57 companies were analyzed.
The calculated ratio for those answers rated from 0 to 4 are the following ones: according to the respondants the personal needs to develop in order to manage IoT-projects are « IT (digital) competencies » (3,02), « Management of innovation » (2,89) and the « Ability to anticipate future trends » (2,88). « Creativity » which was a competence deemed especially relevant to design and implement IoT projects (cf. Q11) is here in 5th position in terms of competences to be developed (2,70).

Q13: How do you judge the IoT concerning the achievement of future business outcomes within your own organization?



Those answers reflect a positive vision from the respondants about the benefits of using IoT for competitiveness and productivity.

Q14: Are you willing to benefit from training provisions in order to manage IoT-projects?

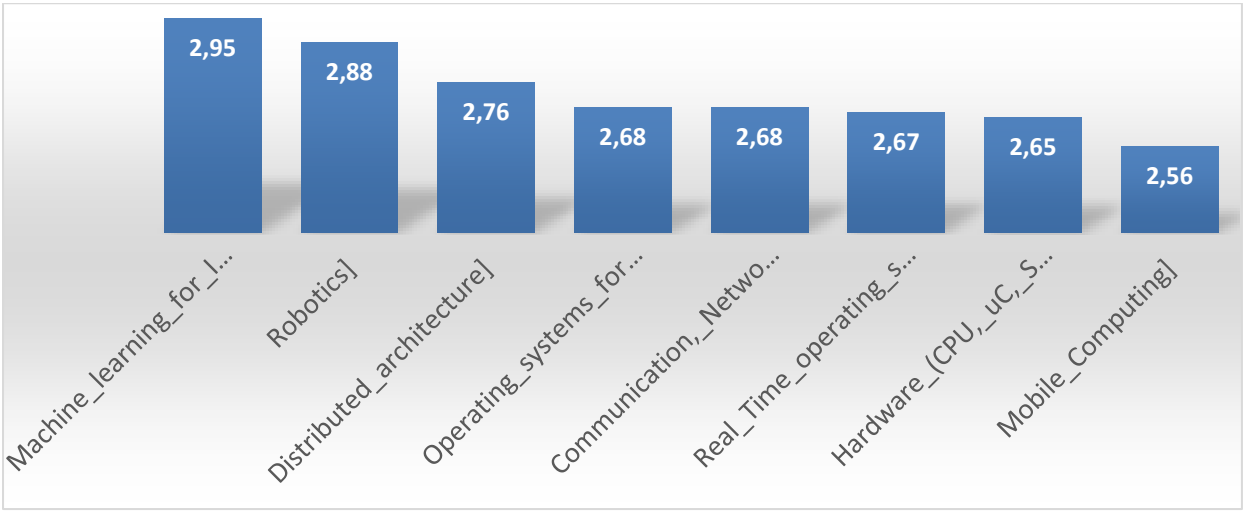


Those answers confirm the results in question Q13 about the need for the respondants to benefit from training provisions in order to manage IoT projects in order to increase the competitiveness and productivity of their company.

Branching depending on profile (job role)

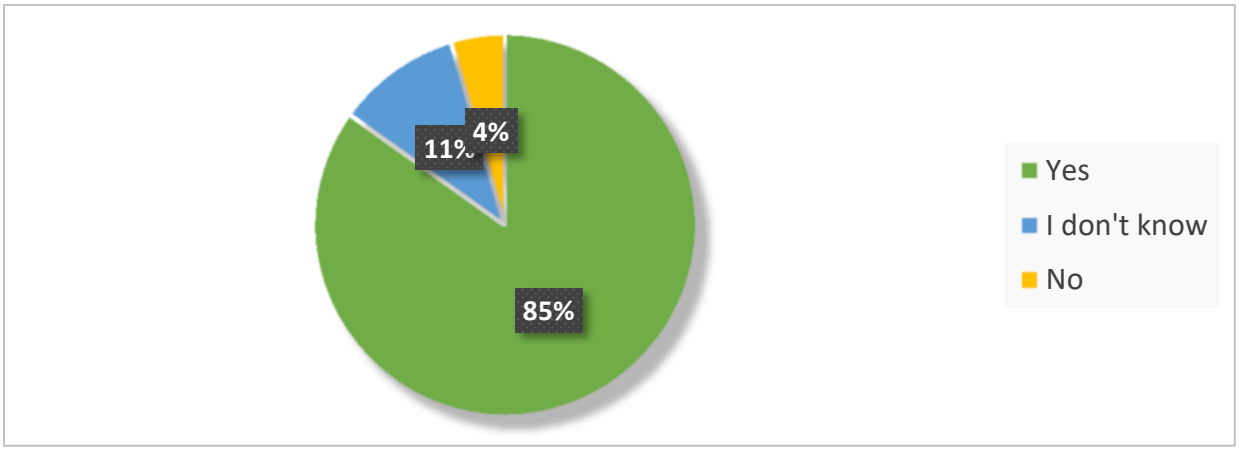
*** IT or ICT staff ***

Q15: Do you have personal needs to improve skills or competences in order to develop IoT-projects (rate your needs from 0 till 4: 0 no needs; highly needed): 68 answers rated from 0 to 4



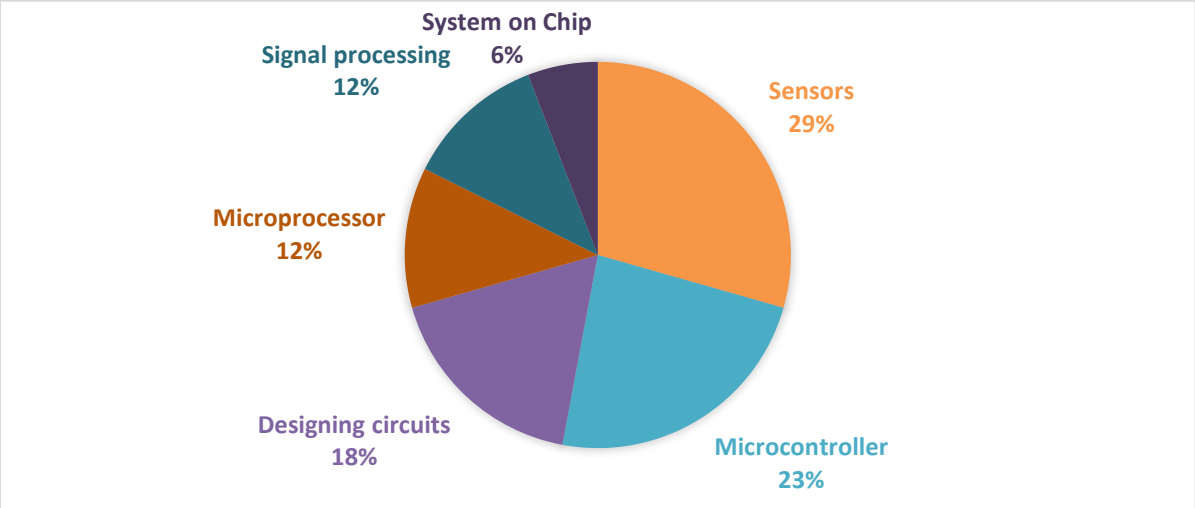
The answers from 68 companies were analyzed.
The calculated ratio for those answers rated from 0 to 4 are the following ones : according to respondants, the personal needs to improve skills or competences in order to **develop** IoT-projects for IT or ICT staff are « Machine learning for IoT » (2,95), « Robotics » (2,88) and « Distributed Architecture » (2,76).

Q16: Are you willing to benefit from training provisions in order to develop IoT-projects?



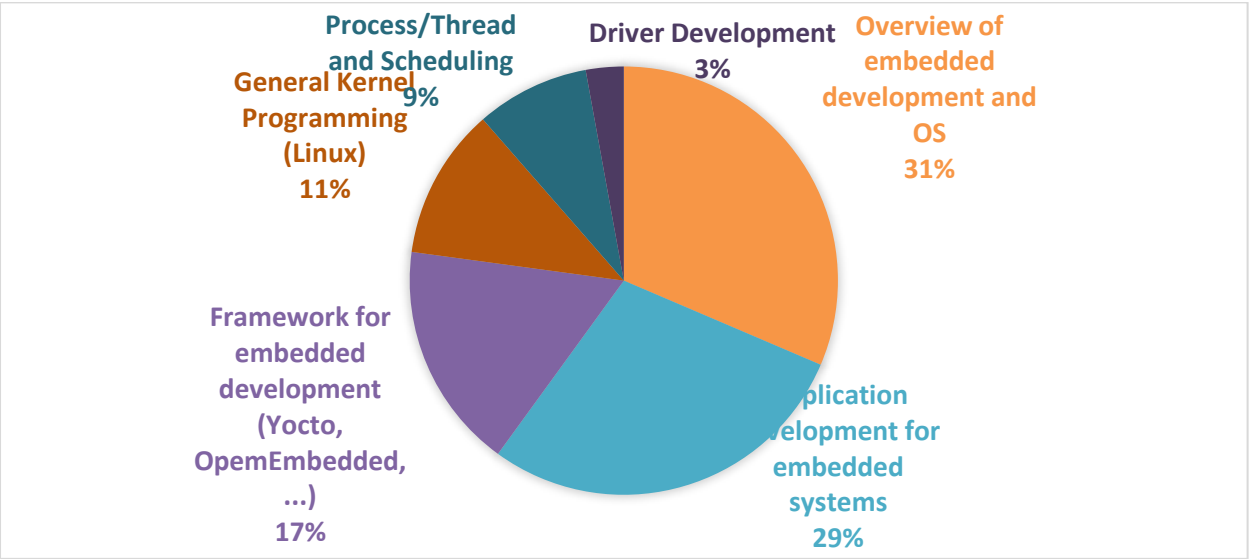
85% of respondants are willing to benefit from training provisions in order to develop IoT projects, 11% of respondants don't know.

Q17a: Which more specific training do you need in „Hardware“ domain?

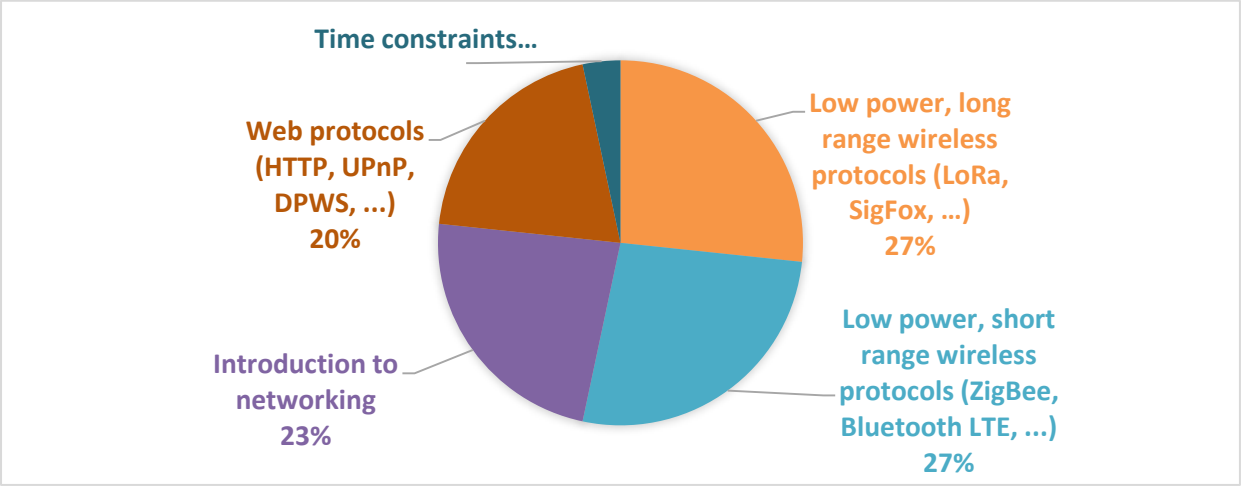


The answers from 34 companies were analyzed. The calculated ratio for those answers rated from 0 to 4 are the following ones: according to the respondants, the more specific trainings needed in the « Hardware » domain are about « Sensors » (29%), « Microcontroller » (23%) and « Designing circuits » (18%). If the number of answers might not be significant enough, clear needs in training provisions about « Hardware » domain nonetheless arouse.

Q17b: Which more specific training do you need in „Operating System for Embedded Systems“ domain?

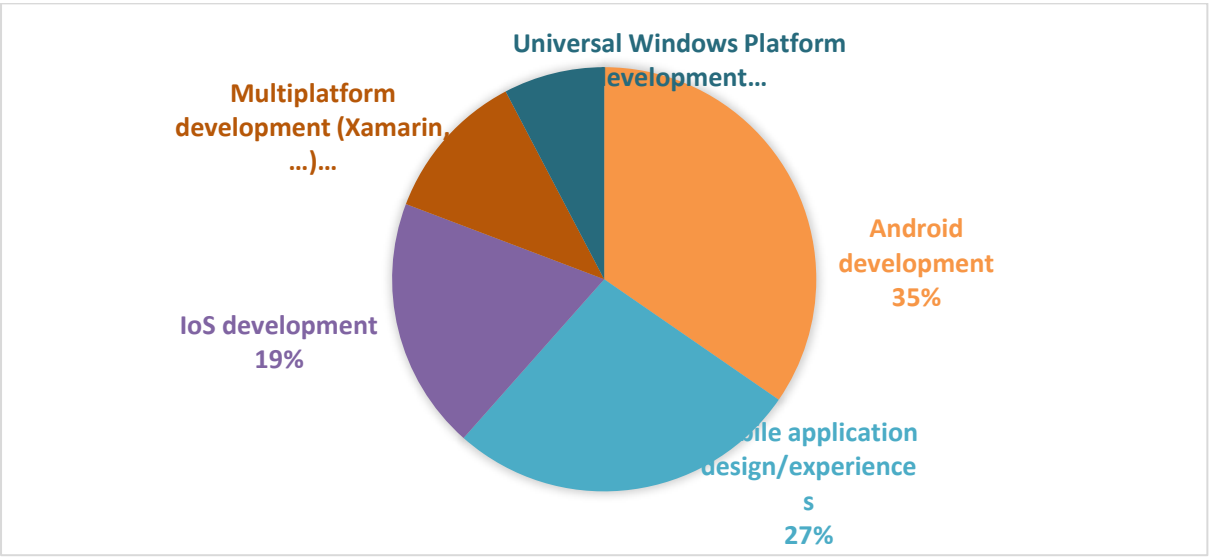


Q17c: Which more specific training do you need in „Communication, Network and Protocols“ domain?



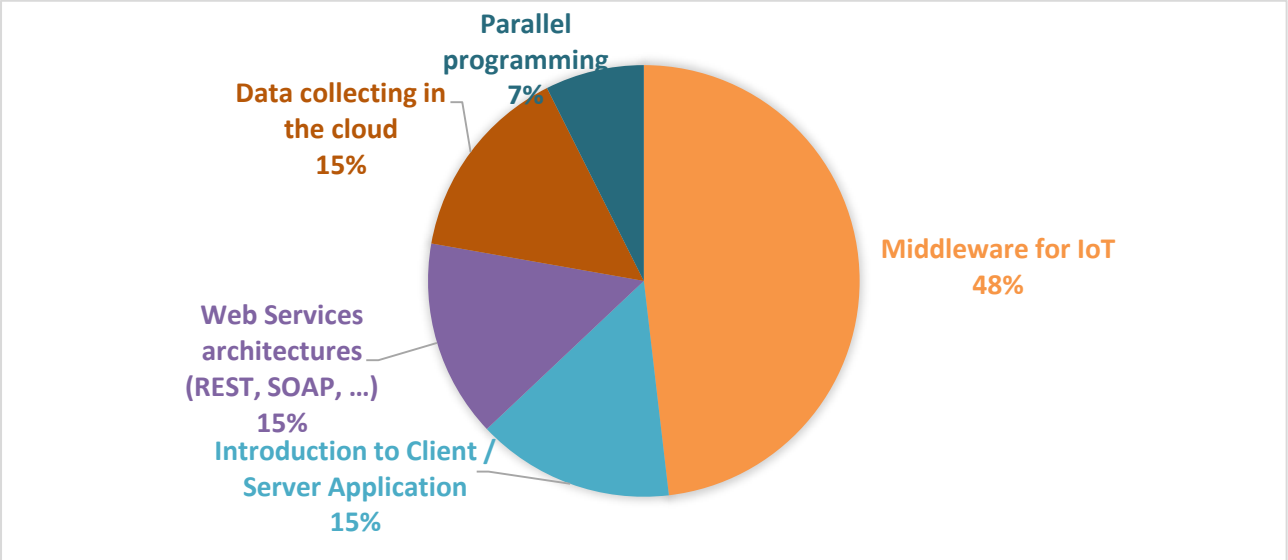
The answers from 30 companies were analyzed. The calculated ratio for those answers rated from 0 to 4 are the following ones: according to respondants, the more specific trainings in « Communication, Network and Protocols » domain are for 54% mostly related to wireless low consumption (« Low power, long range wireless protocols (LoRa, SigFox,…) » (27%) and « Low power, short range wireless protocols (ZigBee, Bluetooth LTE, …) » (27%)). « Introduction to networking » represents 23% of answers.

Q17d: Which more specific training do you need in „Mobile Computing“?



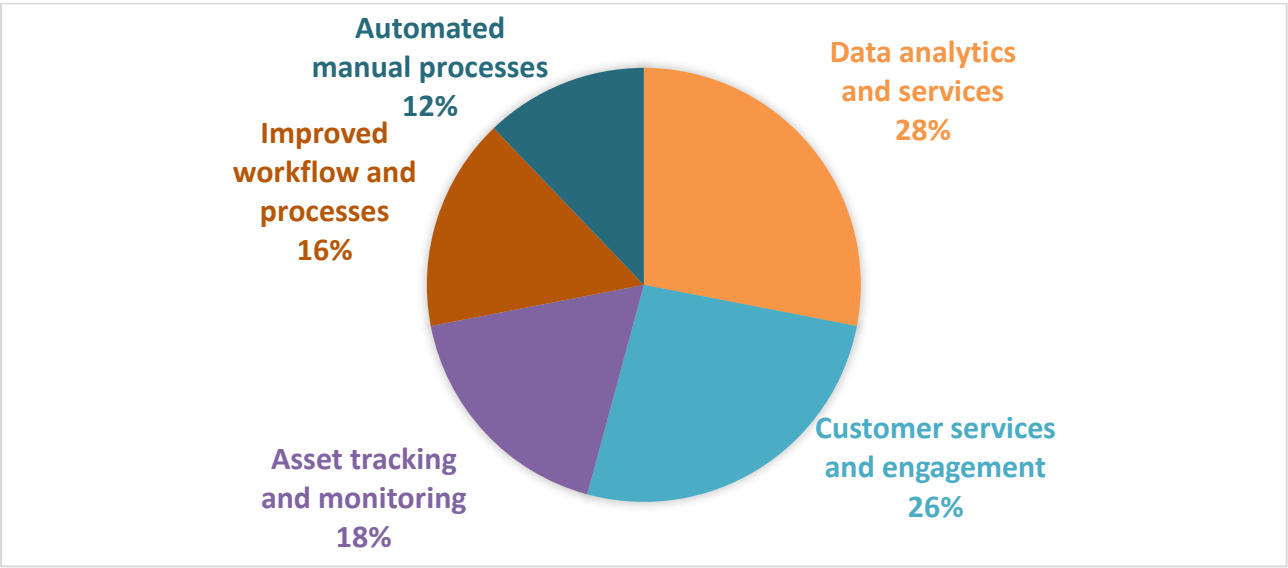
The answers from 26 companies were analyzed.
The calculated ratio for those answers rated from 0 to 4 are the following ones: according to respondants, the more specific trainings needed in « Mobile Computing » are « Android development » (35%), « Mobile application design / experiences » (27%) and « IoS development » (19%).

Q17e: Which more specific training do you need in „Distributed Architecture“?



The answers from 27 companies were analyzed.
The calculated ratio for those answers rated from 0 to 4 are the following ones : according to respondants, the more specific trainings needed in « Distributed Architecture» are « Middleware for IoT» (48%), « Introduction to Client / Server Application» (15%), « Web Services architectures (REST, SOAP,…) (15%) and « Data Collecting in the cloud » (15%).

Q18: Where do you see the biggest advantages to leveraging the IoT within your organization?



The answers from 107 companies were analyzed. According to respondants, the biggest advantages to leveraging the IoT within their organization is « Data analytics an services » (28%), « Customer services » (26%) and « Asset tracking and monitoring » (18%).

Q19: Please state at least three commercial IoT applications in the vicinity of your own organization. Use Product names; example: rule-based analysis of production data based on BOSCH – IoT-Suite Embedded systems

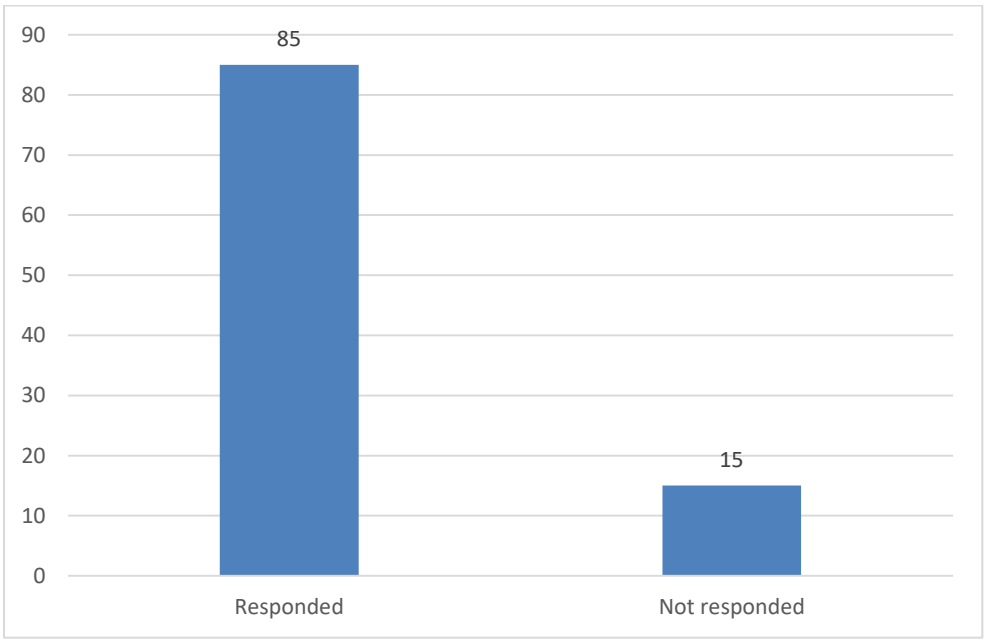
Example 1

Réponse	Décompte	Pourcentage
Réponse	86	85.15%
Sans réponse	15	14.85%

Identifiant (ID)	Réponse
12	Detección de alarmas en sistemas de monitorización y control
33	raspberry pi
47	big data
57	ns
65	Insteon
83	-
84	no lo sé
88	Analisis y control de cultivos viticolas
92	No se
98	....
114	arduino
120	telelectura
131	No se
135	*
140	gestión de residuos
158	Libelium sensor & plug
160	Smart cities
170	Servicios de subscripción en la nube
172	no tenemos
173	Precios
178	Adquisición e instrumentación remota de equipos y sensores
182	Edificios Inteligentes
188	scada
189	simulaciones
192	-
210	Automatizacion
220	Integración de servicios IoT en la nube
230	Laboratorios remotos basados en Arduino
252	I do not know
257	Análisis basado en reglas de producción de datos basado en sistemas embebidos BOSCH – IoT-Suite
258	No sé 1
264	Automatización de climatizacion
265	monitorizacion remota de los equipos que fabricamos
281	X
287	-
288	-
289	Apache SPARK
294	1
328	Rule-based analysis of production data based in Health condition
330	nera
351	-
371	Analisi segni vitali -NTT Hitoe
388	SW SCADA / HMI (Wonderware - InTouch, Copadata - Zenon)
393	INEBULA
400	Na
427	imts
435	Busta paga e caricamento ore
436	Bosh

445	Sistema di manutenzione predittiva
449	Crm
462	Non sono ancora disponibili
477	MySuperabile basata su interazioni di servizi REST e Sistemi oracle integrati
481	Sap
487	Nessuna
500	sistemi distribuzione audio HEOS by Denon - controllo vocale Alexa
514	RFID SMART E HEALTH
516	isole di lavoro e assemblaggio COMAU abbinati a centri Porta solutions
524	BOSCH – IoT-Suite
535	B-Scada
537	non lo so
547	a
556	supporto telematico per impianti del cliente machine to machine
568	gestione magazzino tramite RFID
574	x
580	Big data
595	Training Visuale su prodotti specifici
598	xx
611	Richieste di verifica documentazione
625	N
656	Sensori elettrici
666	Rilevazione dati da campo simatic IOT2000
668	Fiat
695	N/a
724	Improve
729	Netatmo
733	Sviluppo embedded Beckhoff
735	Gestione dati commesse
748	?
751	Gestion de production
757	-
770	boitier de vote / de reponse pour sondage ou examen
775	-
787	piattaforma Cense (Central Nervous System for the Earth) negli Hp Labs
794	je ne sais pas
795	CONNECT ME
812	LabVIEW

Summary of the Q19 Example 1 answers:



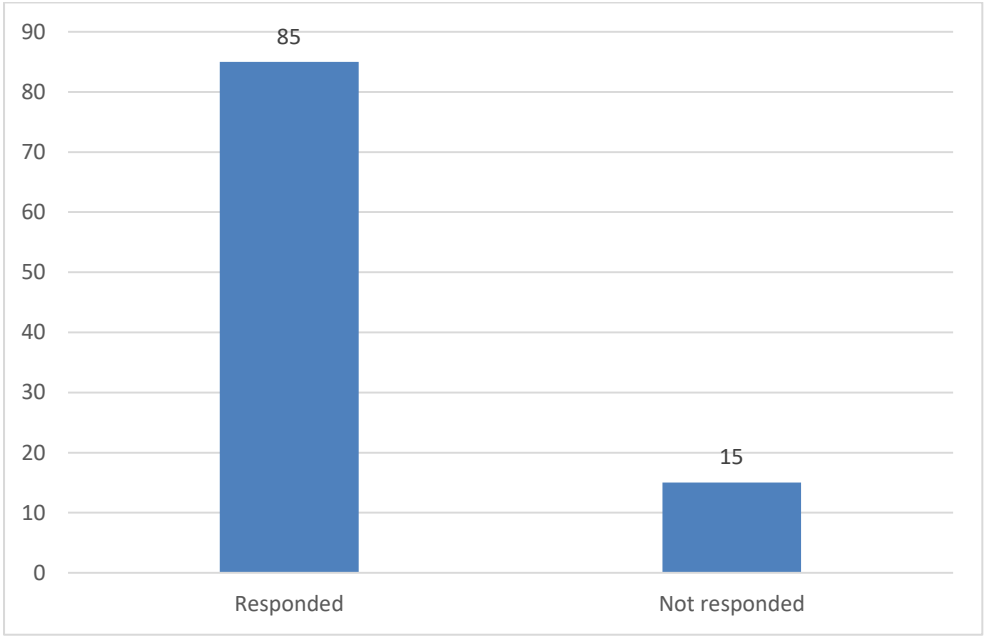
Example 2

Réponse	Décompte	Pourcentage
Réponse	85	84.16%
Sans réponse	16	15.84%

Identifiant (ID)	Réponse
12	.
33	Arduino
47	sensores
57	ns
65	Domotica
83	-
84	no lo sé
88	Monitorización de equipos y aplicaciones
92	No se
98	.....
114	libelium
120	mantenimiento preventivo
135	*
140	gestion de la calidad del agua
158	evineyard
160	Opendata
170	Appis
172	no tenemos
173	Nómina
178	Laboratorios remotos medioambientales
182	Ciudades Conectadas
188	sensor
189	autoaprendizaje
192	-
210	Seguimiento
220	Desarrollo de un sistema de monitorización de vehículos móviles
230	Laboratorios remotos basados en Raspberry Pi
252	I do not know
257	Análisis basado en reglas de producción de datos basado en sistemas embebidos Siemens-IoT-Suite
258	No sé 2
264	Automatización sustema iluminación
265	adquisicion de datos desde sensorica
281	X
287	-
288	-
289	MQTT
294	2
328	Rule-based analysis of production data based in Growth and status of crops
330	nera
351	-
371	Domotica
388	Sensori Smart (Dialog Semiconductor - Bosch)
393	KEPLERO
400	Na
427	imst
435	gestione e preventivi on line verso il cliente
436	Java
445	Sistema di teleassistenza

449	Software gestionali integrati
462	Non sono ancora disponibili
477	Superabile QR applicazione basata su realtà aumentata in grado di interagire con oggetti taggati con codice QR
481	Sap
487	Nessuna
500	QR code per impostazione/gestione telecamere sorveglianza
514	BTICINO
516	isole di lavorazione meccanica connesse in rete
524	BOSCH – IoT-Suite
535	ThingWorx
537	al momento non ne ho idea
547	b
556	acquisizione dati da sensori digitali encoders Heidehman
568	monitoraggio flusso di produzione
574	xx
580	Sas
595	Interazioni sempre più stretta tra venditori e consumatori (es. Generi di prima necessità)
598	xx
611	Inserimento dati
625	N
656	Antifurto
666	Gestione logistica con Siemens simatic IOT2000
668	Icrea
695	n/a
724	Proled
729	Hue Philips
733	analisi di dati su hardware Beckhoff
735	Gestione impianti
748	?
751	Développement produits
757	-
770	consultation page web intranet
775	-
787	XBee Tecnologia wireless di connessione da dispositivo a Cloud
794	je ne sais pas
795	CONNECT ME
812	Server SQL

Summary of the Q19 Example 2 answers



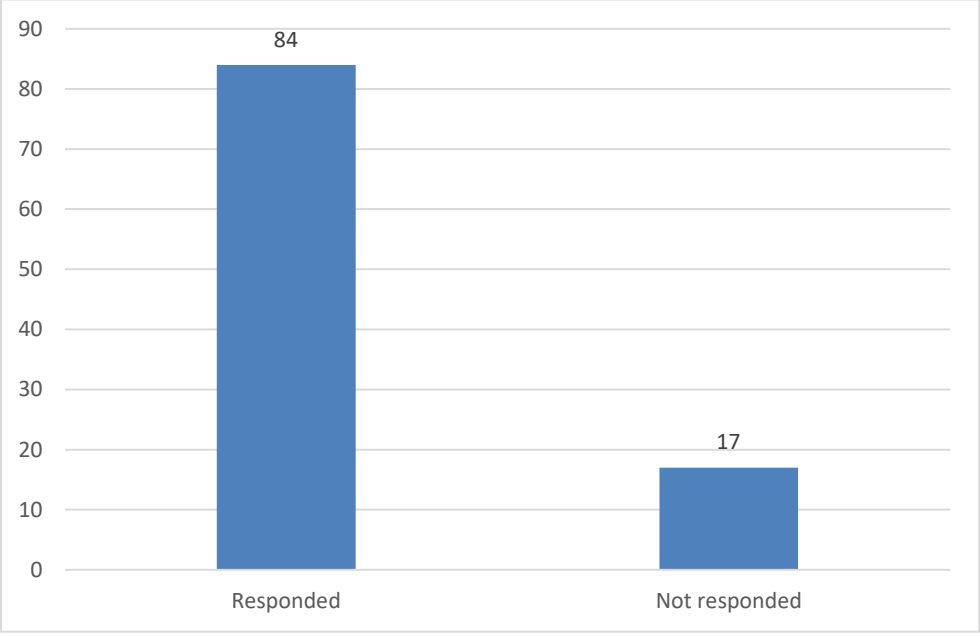
Example 3

Réponse	Décompte	Pourcentage
Réponse	84	83.17%
Sans réponse	17	16.83%

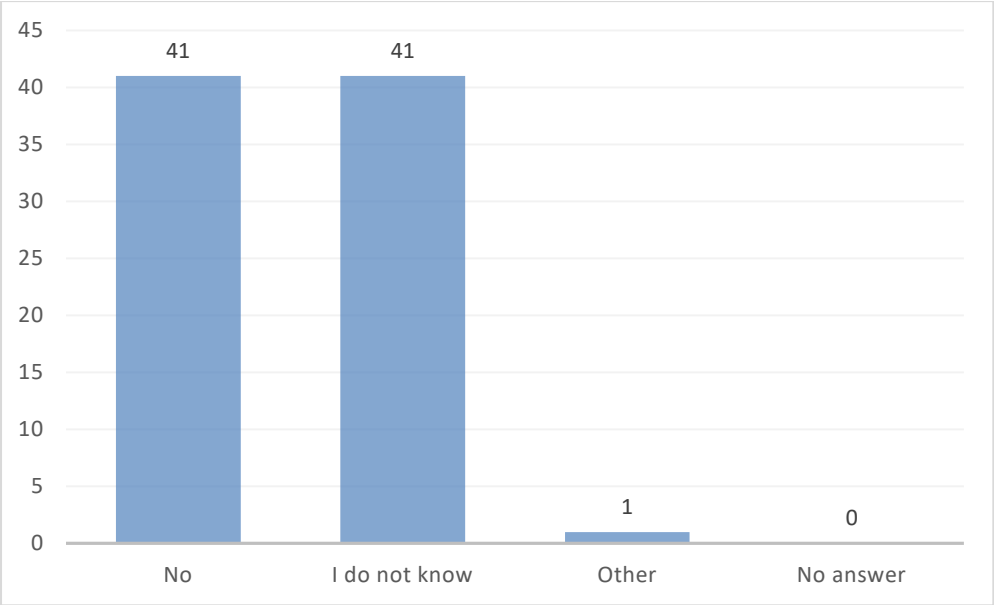
Identifiant (ID)	Réponse
12	.
33	ESP8266
47	monitorización
57	ns
65	Big data
83	-
84	no lo sé
88	Seguimiento de proyectos catastrales
92	No se
98	.....
114	waspmote
120	seguridad
135	*
140	gestion del estacionamiento
158	Andy
160	Plataformas iot
170	Interacción entre tecnoligías
172	no tenemos
173	Prevención
178	Gestión de ubicuidad y movilidad
182	Fábrica Digiltal
188	SOS
189	gamificacion
192	-
210	Control de procesos
220	Desarrolo de analítica de datos de habilidades de conducción
230	Laboratorios remotos basados en Sistemas National Instruments
252	I do not know
257	Análisis basado en reglas de producción de datos basado en sistemas embebidos BOSCH – IoT-Suite
258	No sé 3
264	Monitoreo de datos
265	xxx
281	X
287	-
288	-
289	lora
294	3
328	Rule-based analysis of production data based in behaviors of office users
330	nera
351	-
371	Interazione uomo - robot (NTT Sota)
388	DCS per gestione remota acque (FAST SPA)
393	RFID GLOBAL SOLUTION
400	Na
427	ACSA and ATR
435	monitoraggio del flusso dei clienti attivi e passivi
436	Channell 21
445	Sistema di monitor rodaggio lame

449	Software gestionali integrati
462	Non sono ancora disponibili
477	Superabile QR applicazione basata su realtà aumentata in grado di interagire con oggetti taggati con codice QR
481	Sap
487	Nessuna
500	QR code per impostazione/gestione telecamere sorveglianza
514	BTICINO
516	isole di lavorazione meccanica connesse in rete
524	BOSCH – IoT-Suite
535	ThingWorx
537	al momento non ne ho idea
547	b
556	acquisizione dati da sensori digitali encoders Heidehman
568	monitoraggio flusso di produzione
574	xx
580	Sas
595	Interazioni sempre più stretta tra venditori e consumatori (es. Generi di prima necessità)
598	xx
611	Inserimento dati
625	N
656	Antifurto
666	Gestione logistica con Siemens simatic IOT2000
668	Icrea
695	n/a
724	Proled
729	Hue Philips
733	analisi di dati su hardware Beckhoff
735	Gestione impianti
748	?
751	Développement produits
757	-
770	consultation page web intranet
775	-
787	XBee Tecnologia wireless di connessione da dispositivo a Cloud
794	je ne sais pas
795	CONNECT ME
812	Server SQL

Summary of the Q19 Example 3 answers



Q20: The European Union supports the commercial adoption of the IoT by several programs. Did your organization participate in one of these programs?



41% of respondents claimed that their organisation have not participated in any program supported by European Union, and the same amount of respondents have no information or are not familiar with existing programs for support of IoT adoption.

4 Conclusions and Recommendations

As, in general, the usage of Internet of Things (IoT) is rapidly increasing in various industries, the conducted survey also indicates the high engagement in IoT. About 90% of respondents claimed to be interested in Internet of Things for their organisation, though the familiarity of IoT is rather average, only few more than half of respondents confirmed to be familiar with Internet of Things. The usage/development of IoT in organisation is low, as only 32% of respondents are using/developing IoT in their industry, however similar number of respondents are planning to use/develop it. The main obstacle, preventing from full IoT implementation in the organisation, is the lack of skills and competences in IoT field. Only the minority claimed other reasons, such as financial or security concerns, hindering to use IoT in their industries.

According to the survey, respondents are more interested in developing skills in management, computer science and data analysis domains. This represents, that the barrier for IoT usage/development in the industry is mostly technical aspect, as well as the ability to properly manage/use smart devices. According to the respondents, IoT security and electronics competences are less important, however both domains occupy 20% of field of interest. Moreover, the most relevant competences, when designing and implementing IoT, are perceived creativity, innovation management and IT competences. However, the most demanded skill to be developed for managers is IT (digital), in order, to facilitate and be able to apply Internet of Things withing their organisation. Instead employees working in informations technology domain are mostly intrested in developing machine learning and robotics skills.

In general, according to the survey, respondents are willing to develop skills in particular areas such as sensors, microcontrollers, drivers and complex IoT software interface systems development, as well as mobile applications designing. Also implementation of various domains of communication, network and protocols. Considering the participats of the survey needs, the relavant qualification courses were created in order to provide necessary skills for small and medium enterprise employees to better implement and manage Internet of Things within their organisation.

ANNEX

Questionnaire – English

This questionnaire is carried out within the Erasmus+ European project "IoT4SMEs" (Internet of Things for Small and Medium Enterprises) that aims to provide companies with valuable content and trainings about Internet of Things.
The following survey aims to evaluate the needs required by the labour market about Internet of Things. In that extent, this questionnaire was disseminated by the partners of the project IoT4SMEs among their companies' database to collect their opinion, knowledge and expectations about this topic.
The analysis of the answers will play an important role to design and elaborate adapted courses and trainings related to the Internet of Things that will better meet the market expectations.
The questionnaire was launched on 4 February 2017 and closed on 17 March 2017.
In the whole, 800 companies from different countries participated to this survey, among which companies from France, Italy, Germany, Lithuania, Portugal and Spain

Q1: In which country do you work?

- Italy
- France
- Germany
- Lithuania
- Portugal
- Spain
- Other country: which one?

Q2: How many employees work in your company?

- Less than 10
- Between 10 and 50
- Between 50 and 250
- More than 250

If (Answers to Q2 is not "between 10 and 250") then STOP.

Q3: In which sector does your business/organization operate?

- Telecommunication
- ICT
- Consulting
- Services
- Healthcare
- Retail
- Manufacturing
- Food
- Banking
- Transport / Logistics
- Agriculture
- Industry
- Other sector: which one?

Q4: What is your job role?

- Director/Manager
- IT/ICT, Staff or Project Manager
- Designer (Industrial, Product, Service, User experience)

- Other: which one?

Q5: Are you interested in Internet of Things (IoT) for your business/organization?

- Yes
- No

If (Answer to Q5 = "No") then STOP

Q6: Are you familiar with Internet of Things (IoT)?

- Yes
- No

If (Answer to Q6 is "No") then Q7a

dQ7a: In which domain would you be interested in developing knowledge/skills about Internet of Things (IoT)?

- Computer Science
- Data analysis
- Electronics
- Management
- Security
- Other, which one?

After Q7a STOP

If (Answer to Q6 = "Yes") then Q7b

Q7b: According to you, what best defines the Internet of Things (IoT)? (choose from 1 to 4 answers only)

- Cloud Computing
- Communication Protocols
- Computer Security
- Computer Vision
- Data Mining, data analytics
- Embedded Systems
- Gathering data from sensors
- Machine Learning
- Machine to Machine communication
- Multiprocessing
- Networking
- Object's Tagging (RFID, Beacon, Barcode, …)
- Robotic systems
- Sensors, Actuators
- Services to user
- Smart Objects
- Other: which one?

Q8: Do you use/develop "Internet of Things" (IoT) in your business/organization?

- Yes
- No
- No, but in future

If (Answer to Q8 = "Yes") then Q9a

Q9a: What kind of IoT do you use/develop with your business/organization?

- Object's Tagging (RFID, Beacon, Barcode, …)
- Embedded systems

- Communication protocols
- Sensors, Actuators
- Gathering data from sensors
- Smart Objects
- Robotic systems
- Services to user
- Other: which one?

If (Answer to Q8 = "No" or "No, but in future") then Q9b

Q9b: Why don't you use/develop IoT in your business/organization?

- I'm not aware of IoT benefits
- IoT brings no benefits for my business/organization
- Using IoT is too complex
- Financial reasons
- Security concerns
- Lack of IoT skills/competences
- Other: which one?

Q10: What kind of activity / projects related to "Internet of Things" are you involved in?

- Manage/Facilitate
- Create/Develop
- Other: which one?

If (Answer to Q10 = "Other") then Q7a

Branching depending on profile (job role):

If (Answer to Q10 = "Manage/Facilitate") then Q11

Director, Manager, Designer

Q11: Do you think that the following competences are relevant when designing and implementing IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed)

- Project management
- Ability to anticipate future trends
- Innovation management
- Creativity
- IT (digital) competence
- Analytical thinking
- Others, which ones?

Q12: Do you have personal needs to develop the following competences in order to manage IoT-projects (rate your needs from 0 till 4: 0 no needs; 4 highly needed):

- Project management
- Ability to anticipate future trends
- Innovation management
- Creativity
- IT (digital) competence
- Analytical thinking
- Others, which ones?

Q13: How do you judge the IoT concerning the achievement of future business outcomes within your own organization?

- I would like to learn about the relevance of IoT for my organization
- I agree that organizations that leverage the IoT will have a significant advantage
- I think that IoT is poised for significant growth in the next years
- I agree that there is a lot of confusion surrounding IoT

Q14: Are you willing to benefit from training provisions in order to manage IoT-projects?

- Yes
- No
- I don't know

IT or ICT staff

If (Answer to Q10 = "Create/Develop") then Q15

Q15: Do you have personal needs to improve skills or competences in order to develop IoT-projects (rate your needs from 0 till 4: 0 no needs; highly needed):

- Hardware (CPU, uC, SoC, Sensors, Actuators, ...)
- Operating systems for embedded platforms
- Real Time operating systems
- Robotics
- Communication, Networks and Protocols
- Mobile Computing
- Distributed architecture
- Machine learning for IoT
- Others, which one?

Q16: Are you willing to benefit from training provisions in order to develop IoT-projects?

- Yes
- No
- I don't know

If (Answer to Q16 = "No " or "I don't know") then STOP

Q17a, Q17b, Q17c, Q17d, Q17e to obtain details on large topics presented above.

If (Answer to Q15 = "Hardware") then Q17a

Q17a: Which more specific training do you need in "Hardware" domain?

- Microcontroller
- Microprocessor
- System on Chip
- Sensors
- Actuators
- Designing circuits
- Energy Consumption
- Signal processing

If (Answer to Q15 = "Operating Systems") then Q17b

Q17b: Which more specific training do you need in "Operating System for Embedded Systems" domain?

- Overview of embedded development and OS
- General Kernel Programming (Linux)

- Process/Thread and Scheduling
- Driver Development
- Memory and Filesystems management
- Application development for embedded systems
- Framework for embedded development (Yocto, OpemEmbedded, ...)

If (Answer to Q15 = "Communication, Network, Protocols") then 17c

Q17c: Which more specific training do you need in "Communication, Network and Protocols" domain?

- Introduction to networking
- Low power, short range wireless protocols (ZigBee, Bluetooth LTE, ...)
- Low power, long range wireless protocols (LoRa, SigFox, …)
- Web protocols (HTTP, UPnP, DPWS, ...)
- Time constraints protocols (for audio/video for example)

If (Answer to Q15 = "Mobile Computing") then Q17d

Q17d: Which more specific training do you need in "Mobile Computing"?

- IoS development
- Android development
- Universal Windows Platform development
- Multiplatform development (Xamarin, …)
- Mobile application design/experiences

If (Answer to Q15 = "Distributed Architecture") then Q17e

Q17e: Which more specific training do you need in "Distributed Architecture"?

- Introduction to Client / Server Application
- Web Services architectures (REST, SOAP, …)
- Middleware for IoT
- Data collecting in the cloud
- Concurrent programming
- Parallel programming

Q18: Where do you see the biggest advantages to leveraging the IoT within your organization?

- Data analytics and services
- Customer services and engagement
- Asset tracking and monitoring
- Improved workflow and processes
- Automated manual processes

Q19: Please state at least three commercial IoT applications in the vicinity of your own organization. Use Product names; example: rule-based analysis of production data based on BOSCH – IoT-Suite Embedded systems

- 3 Fields to answer question

Q20: The European Union supports the commercial adoption of the IoT by several programs. Did your organization participate in one of these programs?

- Yes, which one ?
- No
- I don’t know

End1:
We already have enough participants' answers corresponding to your profile. Thank you for participating to this survey.

End2:
Thank you very much for participating to this survey. Your answers will help us better meet your expectations about IoT.

Fragebogen - Deutsch

Sehr geehrte Damen und Herren, ein internationales Konsortium aus Deutschland, Frankreich, Italien, Litauen, Portugal und Spanien führt aktuell ein Projekt aus dem Programm Erasmus+ Strategische Partnerschaften „Internet of Things for Small and Medium Enterprises“ (IoT4SMEs) durch, das aus Mitteln der Europäischen Union finanziert wird. Ziel des Projekts ist es, die Anwendung von Internet der Dinge (kurz IoT) in kleinen und mittelständischen Unternehmen zu unterstützen und entsprechende berufliche Ausbildungsangebote zu entwickeln.
Um die Anforderungen an eine solche Ausbildung möglichst genau zu formulieren, wird von uns eine Befragung durchgeführt. Wir möchten mehr über das bestehende IoT-Wissen sowie über Ihre persönlichen Einschätzungen und Erwartungen von IoT erfahren. Hierzu haben wir den vorliegenden Fragebogen entwickelt und laden Sie ein, diesen auszufüllen.
Die Bearbeitung des Fragebogens wird ca. 10 Minuten in Anspruch nehmen.
Ihre Antworten werden uns wertvolle Erkenntnisse über den aktuellen Stand der IoT-Anwendungen liefern sowie zur Entwicklung von wettbewerbsfähigen Bildungsangeboten wesentlich beitragen.
Selbstverständlich werden alle Angaben anonym ausgewertet und streng vertraulich behandelt.
Wir bedanken uns recht herzlich für Ihre Teilnahme an der Befragung.

Q1: In welchem Land sind Sie tätig?

- Italien
- Frankreich
- Deutschland
- Litauen
- Portugal
- Spanien
- Sonstiges: welches?

Q2: Wie viele Mitarbeiter sind in Ihrem Unternehmen beschäftigt?

- Weniger als 10
- Zwischen 10 und 50
- Zwischen 50 und 250
- Mehr als 250

Hier STOP, wenn die Antwort „Weniger als 10“ oder „Mehr als 250“ ist.

Q3: In welcher Branche ist Ihr Unternehmen tätig?

- Telekommunikation
- Informations- und Kommunikationstechnik
- Beratung
- Dienstleistungen
- Gesundheitswesen/Pflege
- Einzelhandel
- Produktion
- Nahrung
- Bankwesen
- Transport/Logistik
- Landwirtschaft
- Industrie
- Sonstige: welche?

Q4: Was ist Ihre Position im Unternehmen?

- Geschäftsführung
- IT-, Personal- oder Projektmanager
- Entwickler (Industrie, Produkte, Dienstleistungen, Nutzererlebnisse)

- Sonstige: welche?

Q5: Sind Sie interessiert in der Anwendung von IoT in Ihrem Unternehmen?

- Ja
- Nein

Hier STOP, wenn die Antwort zu Q5 „Nein“ ist.

Q6: Sind Sie vertraut mit IoT?

- Ja
- Nein

Wenn Ihre Antwort zu Q6 „Nein“ ist, dann bitte mit Q7a fortsetzen.

Q7a: In welchem Bereich würden Sie Ihr Wissen und Kompetenzen über IoT entwickeln?

- Informatik
- Datenanalyse
- Elektronik
- Management
- Sicherheit
- Sonstiger: welcher?

Hier STOP Wenn Ihre Antwort zu Q6 „Ja“ ist, dann bitte mit Q7b fortsetzen.

Q7b: Ihrer Meinung nach, worüber lässt sich das Internet der Dinge (IoT) am besten definieren? (bitte bis max. 4 Optionen auswählen):

- Cloud Computing
- Übertragungsprotokolle
- Computersicherheit
- Computer Vision
- Data Mining, Datenanalyse
- Eingebettete Systeme (Embedded Systems)
- Datengewinnung über Sensoren
- Maschinelles Lernen (Machine Learning)
- Machine to Machine Communication
- Multiprocessing
- Networking
- Identifikation von Dingen (mit RFID, iBeacon, Barcode, …)
- Robotik (Robotic systems)
- Sensor- und Aktortechnologien
- Dienstleistungen für Nutzer
- Smarte Objekte
- Sonstiges: welches?

Q8: Entwickeln Sie oder wenden Sie IoT in Ihrem Unternehmen an?

- Ja
- Nein
- Nein, aber in der Zukunft

Wenn Ihre Antwort zu Q8 „Ja“ ist, dann bitte mit Q9a fortsetzen.

Q9a: Welche der folgenden IoT-Technologien entwickeln Sie und/oder setzen Sie in Ihrem Unternehmen ein?

- Identifikation von Dingen (mit RFID, iBeacon, Barcode, …)
- Eingebettete Systeme (Embedded systems)
- Übertragungsprotokolle
- Sensor- und Aktortechnologien
- Datengewinnung über Sensoren
- Smarte Objekte
- Robotik
- Dienstleistungen für Nutzer
- Sonstige: welche?

Wenn Ihre Antwort zu Q8 „Nein" oder „Nein, aber in der Zukunft" ist, dann bitte mit Q9b fortsetzen.

Q9b: Warum nutzen/entwickeln Sie IoT in Ihrem Unternehmen nicht?

- Mir sind IoT-Vorteile nicht bekannt
- IoT bringt keinen Mehrwert für mein Unternehmen
- Nutzung von IoT ist zu komplex
- Finanzielle Gründe
- Sicherheitsbedenken
- Fehlende IoT-Kenntnisse und -Kompetenzen
- Sonstige Gründe: welche?

Q10: Welche Funktion haben Sie bei der Umsetzung von IoT-Projekten in Ihrem Unternehmen?

- Manager
- Designer/Entwickler
- Sonstige: welche?

Wenn Ihre Antwort zu Q10 „Sonstige" ist, dann bitte zu Q7a zurückkehren.

Differenzierung nach Jobfunktionen:

Wenn Ihre Antwort zu Q10 „Manager" ist, dann bitte mit Q11 fortsetzen.
Führungskraft, Manager, Designer

Q11: Sind, Ihrer Meinung nach, folgende Kompetenzen bei der Entwicklung und Umsetzung von IoT-Projekten wichtig? (bitte schätzen Sie diese auf der Skala von 0 (= nicht wichtig) bis 4 (= sehr wichtig):

- Projektmanagement
- Fähigkeit, künftige Trends zu antizipieren
- Innovationsmanagement
- Kreativität
- Informatik- & Programmierkenntnisse
- Analytisches Denken
- Sonstige Kompetenzen: welche?

Q12: Haben Sie Bedarf an der Entwicklung von folgenden Kompetenzen, um IoT-Projekte zu managen? (bitte schätzen Sie diese auf der Skala von 0 (= nicht wichtig) bis 4 (= sehr wichtig):

- Projektmanagement
- Fähigkeit, künftige Trends zu antizipieren
- Innovationsmanagement
- Kreativität

- Informatik- & Programmierkenntnisse
- Analytisches Denken
- Sonstige Kompetenzen: welche?

Q13: Wie schätzen Sie IoT-Potenziale für die Erreichung der Unternehmensziele ein?

- Ich möchte mehr über die Vorteile von IoT für mein Unternehmen erfahren
- Ich glaube, Unternehmen, die IoT wirksam einsetzen, werden davon deutlich profitieren
- Ich denke, IoT-Einsatz wird in den nächsten Jahren signifikant zuwachsen
- Ich stimme zu, dass IoT mit vielen Unsicherheiten verbunden ist.

Q14: Würden Sie Trainingsangebote in Anspruch nehmen, um IoT-Projekte managen zu können?

- Ja
- Nein
- Ich weiß nicht

IT/ICT-Personal

Wenn Ihre Antwort zu Q10 „Designer/Entwickler" ist, dann bitte mit Q15 fortsetzen.

Q15: Haben Sie Bedarf an der Entwicklung von folgenden Kenntnissen, um IoT-Projekte zu entwickeln? (bitte schätzen Sie diese auf der Skala von 0 (= nicht wichtig) bis 4 (= sehr wichtig):

- Hardware (Verarbeitung, Sensoren, Aktuatoren, ...)
- Betriebssysteme für IoT-Plattformen
- Echtzeitbetriebssysteme
- Robotik
- Datenkommunikation, Netze & Protokolle
- Mobile Computing
- Verteilte Systeme
- Machine Learning für IoT
- Sonstige: welche?

Q16: Würden Sie Trainingsangebote in Anspruch nehmen, um IoT-Projekte entwickeln zu können?

- Ja
- Nein
- Ich weiß nicht

Hier STOP, wenn Ihre Antwort zu Q16 „Nein" oder „Ich weiß nicht" ist.

Bitte beantworten Sie noch Fragen unter Q17a, Q17b, Q17c, Q17d, Q17e, um mehr Details zu den oben genannten größeren Themen zu erhalten.

Wenn Ihre Antwort zu Q15 „Hardware" ist, dann bitte mit Q17a fortsetzen.

Q17a: In welchen der unten genannten Themen unter „Hardware" besteht bei Ihnen Trainingsbedarf?

- Microcontroller
- Microprocessor
- Schaltkreise
- Sensoren
- Aktuatoren
- Schaltungsentwurf

- Energieverbrauch
- Signalverarbeitung

Wenn Ihre Antwort zu Q15 „Betriebssysteme“ ist, dann bitte mit Q17b fortsetzen.

Q17b: In welchen der unten genannten Themen aus dem Bereich „Betriebssysteme“ besteht bei Ihnen Trainingsbedarf? "

- Überblick über Embedded Development und Betriebssysteme
- Kernel Programming (Linux)
- Process/Thread and Scheduling
- Entwicklung von Treibern
- Speicherverwaltung
- Anwendungsentwicklung für Embedded Systems
- Framework for embedded development (Yocto, OpemEmbedded, ...)

Wenn Ihre Antwort zu Q15 „Datenkommunikation, Netze & Protokolle“ ist, dann bitte mit Q17c fortsetzen.

Q17c: In welchen der unten genannten Themen aus dem Bereich „Datenkommunikation, Netze & Protokolle“ besteht bei Ihnen Trainingsbedarf?

- Einführung in Netzwerktechnologien
- Low power, Short Range Wireless Protocols (ZigBee, Bluetooth LTE, ...)
- Low power, Long Range Wireless Protocols (LoRa, SigFox, …)
- TCP/IP-Anwendungsprotokolle (HTTP, UPnP, DPWS, ...)
- Zeitkritische Protokolle (z.B. für Audio, Video)

Wenn Ihre Antwort zu Q15 „Mobile Computing“ ist, dann bitte mit Q17d fortsetzen.

Q17d: In welchen der unten genannten Themen aus dem Bereich „Mobile Computing“ besteht bei Ihnen Trainingsbedarf?

- IoS Entwicklung
- Android Entwicklung
- Windows Plattform Entwicklung
- Multiplattform Entwicklung (Xamarin, …)
- Entwurf mobiler Anwendungen / Apps

Wenn Ihre Antwort zu Q15 „Verteilte Systeme“ ist, dann bitte mit Q17e fortsetzen.

Q17e: In welchen der unten genannten Themen aus dem Bereich "Verteilte Systeme" besteht bei Ihnen Trainingsbedarf?

- Einführung zu Client / Server-Anwendungen
- Web Services Architekturen (REST, SOAP, …)
- Middleware für IoT
- Cloud Data Collection
- Konkurrente Programmierung
- Parallele Programmierung

Q18: In welchen Bereichen sehen Sie die größten Vorteile vom IoT-Einsatz in Ihrem Unternehmen?

- Datenanalyse und Dienstleistungen
- Kundenbetreuung und -bindung
- Tracking und Monitoring
- Verbesserte Abläufe und Prozesse
- Automatisierung klassischer Prozesse

Q19: Bitte nennen Sie mind. 3 kommerzielle IoT-Produkte, welche in Ihrem Unternehmen zum Einsatz kommen. Benutzen Sie dabei Produktnamen, z.B. Regelbasierte Analyse von Produktionsdaten mit der BOSCH – IoT-Suite

- 3 Produktnamen

Q20: Europäische Union unterstützt die IoT-Anwendungen durch verschiedene Förderprogramme. Hat Ihr Unternehmen an einem dieser Programme teilgenommen?

- Ja (bitte machen Sie Angaben zum Programm?)
- Nein
- Ich weiß nicht

End1:
Wir haben genügend Rückmeldungen von Teilnehmern mit ähnlichem Profil erhalten. Wir danken Ihnen herzlichst für Ihre Teilnahme.

End2:
Wir danken Ihnen herzlichst für die Teilnahme an der Befragung. Ihre Antworten werden uns helfen, auf die Erwartungen des IoT-Markts besser zu reagieren.

Cuestionario - Español

Este cuestionario es realizado dentro del proyecto europeo Erasmus+ European “IoT4SMEs” (Internet of Things for Small and Medium Enterprises) cuyo objetivo es ofrecer contenido de valor y formación a empresas sobre Internet de las Cosas.
El objetivo de la siguiente encuesta es evaluar las necesidades del mercado sobre Internet de las Cosas. Nos gustaría recoger tu opinión, conocimientos y necesidades sobre este tema. Para ello, hemos diseñado un cuestionario breve que lleva menos de 10 minutos de completar. El análisis de las respuestas jugará un rol importante para elaborar cursos adaptados para estudiantes del Internet de las Cosas.
Te damos las gracias por tu participación, que nos permitirá diseñar e implementar formaciones relacionadas con el Internet de las Cosas adaptadas a las necesidades del mercado.
Garantizamos que la información será tratada con total confidencialidad.

Q1: ¿En qué país trabajas?

- Italia
- Francia
- Alemania
- Lituania
- Portugal
- España
- Otro país: ¿cuál?

Q2: ¿Cuántos empleados trabajan en tu empresa?

- Menos de 10
- Entre 10 y 50
- Entre 50 y 250
- Más de 250

If (Answers to Q2 is not "between 10 and 250") then STOP.

Q3: ¿En qué sector opera tu organización/negocio?

- Telecomunicaciones
- TICs
- Consultoría
- Servicios
- Salud
- Comercio
- Manufactura
- Alimentación
- Banca
- Transporte / Logística
- Agricultura
- Industria
- Otro sector: ¿cuál?

Q4: ¿Cuál es tu puesto?

- Director/Manager
- Técnico o Gestor de proyecto
- Diseñador (Industrial, producto, servicio, experiencia de usuario)
- Otro: ¿cuál?

Q5: ¿Estás interesados en el Internet de las Cosas para tu empresa/organización?

- Sí
- No

If (Answer to Q5 = "No") then STOP

Q6: ¿Estás familiarizado con el Internet de las Cosas?

- Sí
- No

If (Answer to Q6 is "No") then Q7a

Q7a: ¿En qué dominio estarías interesado en desarrollar conocimientos/habilidades sobre el Internet de las Cosas?

- Programación
- Análisis de datos
- Electrónica
- Gestión
- Seguridad
- Otro: ¿cuál?

After Q7a STOP If (Answer to Q6 = "Sí") then Q7b

Q7b: Según tu opinión, qué define mejor al Internet de las Cosas? (elige solo de 1 a 4 respuestas)

- Computación en la nube
- Protocolos de comunicación
- Seguridad informática
- Visión por computador
- Minería de datos, analíticas de datos
- Sistemas embebidos
- Recogida de datos desde los sensores
- Machine Learning
- Comunicación máquina-máquina
- Multiprocesamiento
- Redes
- Etiquetado de objetos (RFID, balizas, código de barras, …)
- Sistemas robóticos
- Sensores, Actuadores
- Servicios al usuario
- Objetos inteligentes
- Otro: ¿cuál?

Q8: ¿Usas/desarrollas Internet de las Cosas en tu empresa/organización?

- Sí
- No
- No, pero en el futuro sí

If (Answer to Q8 = "Sí") then Q9a

Q9a: ¿Qué tipo de Internet de las Cosas usas/desarrollas en tu empresa/organización?

- Etiquetado de objetos (RFID, balizas, código de barras, …)
- Sistemas embebidos
- Protocolos de comunicación
- Sensores, Actuadores
- Recogida de datos desde sensores
- Objetos inteligentes

- Sistemas robóticos
- Servicios al usuario
- Otro: ¿cuál?

If (Answer to Q8 = "No" or "No, but in future") then Q9b

Q9b: ¿Por qué no usas/desarrollas Internet de las Cosas en tu empresa/organización?

- No soy consciente de los beneficios del Internet de las Cosas
- El Internet de las Cosas no ofrece ningún beneficio a mi negocio/organización
- Usar el Internet de las Cosas es demasiado complejo
- Razones financieras
- Preocupaciones sobre seguridad informática
- Falta de habilidades/competencias sobre el Internet de las Cosas
- Otro: ¿cuál?

Q10: ¿En qué tipo de actividad/proyectos relacionados con el Internet de las Cosas estás involucrado?

- Gestionar/Facilitar
- Crear/Desarrollar
- Otro: ¿cuál?

If (Answer to Q10 = "Other") then Q7a

Desarrollar en ramas según perfil (puesto de trabajo):

If (Answer to Q10 = "Manage/Facilitate") then Q11

Director, Manager, Designer

Q11: ¿Crees que las siguientes competencias son relevantes al diseñar e implementar proyectos de Internet de las Cosas? (valora tus necesidades del 0 al 4: 0 sin necesidades; 4 altamente necesitadas)

- Gestión proyecto
- Habilidad para anticipar tendencias futuras
- Gestión innovación
- Creatividad
- Competencia TICs (digital)
- Pensamiento analítico
- Otros: ¿cuáles?

Q12: ¿Tienes necesidades personales para desarrollar las siguientes competencias para gestionar proyectos de Internet de las Cosas (valora tus necesidades del 0 al 4: 0 sin necesidades; 4 altamente necesitadas)

- Gestión proyecto
- Habilidad para anticipar tendencias futuras
- Gestión innovación
- Creatividad
- Competencia TICs (digital)
- Pensamiento analítico
- Otros: ¿cuáles?

Q13: ¿Cómo juzgas el Internet de las Cosas de acuerdo a la consecución de futuros resultados de negocio dentro de tu propia organización?

- Me gustaría aprender sobre Internet de las Cosas para mi organización
- Estoy de acuerdo en que las organizaciones que liderar el Internet de las Cosas tendrán una ventaja significativa
- Creo que el Internet de las Cosas tendrá un crecimiento significativo en los próximos años
- Estoy de acuerdo en que hay mucha confusión alrededor del Internet de las Cosas

Q14: ¿Estás dispuesto a aprovecharte de cursos formativos para gestionar proyectos del Internet de las Cosas?

- Sí
- No
- No lo sé

IT or ICT staff

If (Answer to Q10 = "Create/Develop") then Q15

Q15: ¿Tienes necesidades personales para mejorar habilidades o competencias para desarrollar proyectos de Internet de las Cosas (valora tus necesidades del 0 al 4: 0 sin necesidades; 4 altamente necesitadas):

- Hardware (CPU, microcontroller, SoC, Sensores, Actuadores, ...)
- Sistemas Operativos para plataformas embebidas
- Sistemas Operativos de Tiempo Real
- Robótica
- Comunicación, Redes y Protocolos
- Computación móvil
- Arquitectura distribuida
- Machine learning
- Otros: ¿cuáles?

Q16: ¿Estás dispuesto a aprovecharte de cursos formativos para desarrollar proyectos de Internet de las Cosas?

- Sí
- No
- No lo sé

If (Answer to Q16 = "No " or "I don't know") then STOP

Q17a, Q17b, Q17c, Q17d, Q17e to obtain details on large topics presented above.

If (Answer to Q15 = "Hardware") then Q17a

Q17a: ¿Qué formación específica necesitas en el dominio "Hardware"?

- Microcontroladores
- Microprocesadores
- System on Chip
- Sensores
- Actuadores
- Diseño de circuitos
- Consumo de Energía
- Procesamiento de señal

If (Answer to Q15 = "Operating Systems") then Q17b

Q17b: ¿Qué formación específica necesitas en el dominio de "Sistemas Operativos para Sistemas Embebidos"?

- Visión general de desarrollos embebidos y sistemas operativos
- Programación general de Kernel (Linux)
- Procesos/Hilos y programación de tareas
- Desarrollo de Drivers
- Gestión de memoria y sistema de ficheros
- Desarrollo de aplicaciones para sistemas embebidos

- Framework para desarrollos embebidos (Yocto, OpemEmbedded, ...)

If (Answer to Q15 = "Communication, Network, Protocols") then 17c

Q17c: ¿Qué formación específica necesitas en el dominio de "Comunicación, Redes y Protocolos"?

- Introducción a redes
- Protocolos inalámbricos de bajo consumo y corto alcance (ZigBee, Bluetooth LTE, ...)
- Protocolos inalámbricos de bajo consumo y largo alcance (LoRa, SigFox, …)
- Protocolos Web (HTTP, UPnP, DPWS, ...)
- Protocolos con limitaciones de tiempo (para audio/video por ejemplo)

If (Answer to Q15 = "Mobile Computing") then Q17d

Q17d: ¿Qué formación específica necesitas en el dominio de "Computación móvil"?

- Desarrollo IOs
- Desarrollo Android
- Desarrollo Plataforma Universal Windows
- Desarrollo Multiplataforma (Xamarin, …)
- Diseño/experiencias de aplicaciones móviles

If (Answer to Q15 = "Distributed Architecture") then Q17e

Q17e: ¿Qué formación específica necesitas en el dominio de "Arquitectura distribuida"?

- Introducción a las aplicaciones Cliente / Servidor
- Arquitecturas de Servicios Web (REST, SOAP, …)
- Middlewares para Internet de las Cosas
- Recogida de datos en la nube
- Programación concurrente
- Programación paralela

Q18: ¿Donde ves las principales ventajas del Internet de las Cosas dentro de tu organización?

- Analíticas de datos y servicios
- Servicios de implicación del cliente
- Seguimiento y monitoreo de recursos
- Flujos de trabajo y procesos mejorados
- Procesos manuales automáticos

Q19: Por favor indica al menos 3 aplicaciones comerciales de Internet de las Cosas relacionadas con tu propia organización. Usa nombres de producto; ejemplo: Análisis basado en reglas de producción de datos basado en sistemas embebidos BOSCH – IoT-Suite

- 3 campos para contestar la pregunta

Q20: La Unión Europea fomenta la adopción comercial del Internet de las Cosas por varios programas. ¿Participa tu organización en alguno de estos programas?

- Sí, ¿cuál?
- No
- No lo sé

End1:
Ya tenemos bastantes respuestas de participantes con tu mismo perfil. Gracias por participar en esta encuesta.

End2:

Muchas gracias por participar en esta encuesta. Tus respuestas nos ayudarán a atender mejor tus expectativas sobre el Internet de las Cosas.

Questionnaire - Français

Ce questionnaire est mené dans le cadre du projet “IoT4SMEs” (Internet of Things for Small and Medium Enterprises) financé par le Programme Européen Erasmus+. Le but de ce projet est de proposer aux entreprises des formations adaptées sur le thème des Objets Connectés.
Le questionnaire suivant a donc pour objectif d’évaluer les besoins du marché du travail par rapport aux Objets Connectés. Nous souhaiterions en effet connaître votre avis, vos connaissances et vos attentes sur cette thématique. A ces fins, nous avons élaboré un court questionnaire de moins de 10 minutes. L’analyse des réponses jouera un rôle important dans l’élaboration de formations adaptées aux entreprises sur le thème des Objets Connectés.
Nous vous remercions par avance pour votre participation qui va nous permettre d’élaborer et de mettre en oeuvre des formations sur les Objets Connectés qui saurons répondre aux besoins et aux attentes du marché.
Nous garantissons que les informations collectées seront traitées en toute confidentialité.

Q1: Dans quel pays travaillez-vous ?

- Italie
- France
- Allemagne
- Lituanie
- Portugal
- Espagne
- Autre pays : lequel?

Q2: Combien de salariés travaillent dans votre entreprise ?

- Moins de 10
- Entre 10 et 50
- Entre 50 et 250
- Plus de 250

If (Answers to Q2 is not "between 10 and 250") then STOP.

Q3: A quel secteur appartient votre entreprise ?

- Télécommunication
- Technologies de l’Information et de la Communication
- Consulting
- Services
- Santé
- Commerce de détail
- Fabrication
- Alimentation
- Banque
- Transport / Logistique
- Agriculture
- Industrie
- Autre secteur : lequel?

Q4: Quelle est votre fonction?

- Directeur/Cadre
- Chef de projet / Personnel Informatique
- Designer (Industriel, Produit, Service, Expérience utilisateur)
- Autre: laquelle?

Q5: Etes-vous intéressé(e) par les Objets Connectés (Internet of Things) pour votre entreprise ?

- Oui
- Non

If (Answer to Q5 = "No") then STOP

Q6: Connaissez-vous les Objets Connectés ?

- Oui
- Non

If (Answer to Q6 is "No") then Q7a

Q7a: Dans quel domaine seriez-vous intéressé(e) de développer des connaissances/compétences sur le thème des Objets Connectés ?

- Informatique
- Analyse des données
- Electronique
- Gestion
- Sécurité
- Autre, lequel?

After Q7a STOP If (Answer to Q6 = "Yes") then Q7b

Q7b: Selon vous, qu'est-ce qui définit le mieux les Objets Connectés ? (choisissez 1 à 4 réponses maximum)

- Cloud Computing
- Protocoles de communication
- Sécurité informatique
- Vision assistée par ordinateur
- Data Mining, analyse des données
- Systèmes intégrés
- Collecte des données par capteurs
- Apprentissage automatique
- Communication Machine à Machine
- Multitraitement
- Gestion de réseau
- Object's Tagging (RFID, Beacon, Barcode, …)
- Systèmes robotique
- Capteurs, Déclencheurs
- Services à l'utilisateur
- Objets intelligents
- Autre: lequel?

Q8: Utilisez/développez-vous des Objets Connectés dans votre entreprise ?

- Oui
- Non
- Non, mais dans le futur

If (Answer to Q8 = "Yes") then Q9a

Q9a: Quel type d'Objets Connectés utilisez/développez-vous dans votre entreprise ?

- Object's Tagging (RFID, Beacon, Barcode, …)
- Systèmes intégrés
- Protocoles de communication

- Capteurs, Déclencheurs
- Collecte des données par capteurs
- Objets intelligents
- Système robotique
- Services à l'utilisateur
- Autre: lequel?

If (Answer to Q8 = "No" or "No, but in future") then Q9b

Q9b: Pourquoi n'utilisez/ne développez-vous pas d'Objets Connectés dans votre entreprise ?

- Je ne suis pas au courant des avantages des Objets Connectés
- Les Objets Connectés n'apportent aucun avantage à mon entreprise
- Utiliser des Objets Connectés est trop complexe
- Raisons financières
- Raisons de sécurité
- Manque de compétences en informatique
- Autre: quelle raison ?

Q10: Dans quel genre d'activités / projets liés aux Objets Connectés êtes-vous impliqué(e) ?

- Gérer/Faciliter
- Créer/Développer
- Autre: lequel?

If (Answer to Q10 = "Other") then Q7a

Branching depending on profile (job role):

If (Answer to Q10 = "Manage/Facilitate") then Q11

Director, Manager, Designer

Q11: Pensez-vous que les compétences suivantes soient pertinentes pour la conception et la mise en oeuvre de projets liés aux Objets Connectés (noter les besoins en compétences de à à 4 : 0 = pas de besoin, 4 = fort besoin)

- Gestion de projet
- Capacité à anticiper les futures tendances
- Gestion de l'innovation
- Créativité
- Compétences digitales / informatique
- Pensée analytique
- Autres, lesquelles?

Q12: Avez-vous des besoins personnels en compétences que vous souhaiteriez améliorer pour gérer vos projets liés aux Objets Connectés ? (noter ces besoins de 0 à 4 : 0 = pas de besoin, 4 = fort besoin)

- Gestion de projet
- Capacité à anticiper les futures tendances
- Gestion de l'innovation
- Créativité
- Compétences digitales / informatique
- Pensée analytique
- Autres, lesquels?

Q13: Que pensez-vous des Objets Connectés en ce qui concerne la réalisation de futurs résultats opérationnels au sein de votre propre entreprise ?

- Je souhaiterais savoir si les Objets Connectés seraient pertinents pour mon entreprise

- Je suis d'accord avec le fait que les entreprises qui exploitent les Objets Connectés auront un avantage significatif
- Je pense que les Objets Connectés sont destinés à une croissance significative dans les prochaines années
- Je suis d'accord qu'une grande confusion règne autour des Objets Connectés

Q14: Seriez-vous prêt(e) à bénéficier de formations dans le but de gérer des projets liés aux Objets Connectés ?

- Oui
- Non
- Je ne sais pas

IT or ICT staff

If (Answer to Q10 = "Create/Develop") then Q15

Q15: Avez-vous des besoins personnels en compétences que vous souhaiteriez améliorer pour développer des projets liés aux Objets Connectés ? (noter ces besoins de 0 à 4 : 0 = pas de besoin, 4 = fort besoin)

- Hardware (CPU, uC, SoC, Capteurs, Déclencheurs, ...)
- Systèmes d'exploitation pour plateformes intégrées
- Systèmes d'exploitation en Temps Réel
- Robotique
- Communication, Réseaux et Protocoles
- Informatique Mobile
- Architecture Distribuée
- Apprentissage Machine pour les Objets Connectés
- Autres, lesquels?

Q16: Seriez-vous prêt(e) à bénéficier de formations dans le but développer des projets liés aux Objets Connectés ?

- Oui
- Non
- Je ne sais pas

If (Answer to Q16 = "No " or "I don't know") then STOP

Q17a, Q17b, Q17c, Q17d, Q17e to obtain details on large topics presented above.

If (Answer to Q15 = "Hardware") then Q17a

Q17a: De quelle formation plus spécifique auriez-vous besoin dans le domaine "Equipement, Matériel" ?

- Microcontrôleur
- Microprocesseur
- Système sur Puce
- Capteurs
- Déclencheurs
- Conception de circuits
- Consommation d'Énergie
- Traitement du signal

If (Answer to Q15 = "Operating Systems") then Q17b

Q17b: De quelle formation plus spécifique auriez-vous besoin dans le domaine "Système d'exploitation pour Systèmes Intégrés" ?

- Vue d'ensemble de développement et de système d'exploitation intégrés

- Programmation Générale Kernel (Linux)
- Traitement/Fil et Planification
- Développement de Pilote
- Gestion de Mémoire et Systèmes de fichiers
- Développement d'Application pour les systèmes intégrés
- Cadre pour le développement intégré (Yocto, OpemEmbedded, ...)

If (Answer to Q15 = "Communication, Network, Protocols") then 17c

Q17c: De quelle formation plus spécifique auriez-vous besoin dans le domaine "Communication, Réseau et Protocoles"?

- Introduction à la mise en réseau
- Protocoles à faible puissance et faible portée sans fil (ZigBee, Bluetooth LTE, ...)
- Protocoles à faible puissance et longue portée sans fil (LoRa, SigFox, …)
- Protocoles web (HTTP, UPnP, DPWS, ...)
- Protocoles à contrainte de temps (pour l'audio et la vidéo par exemple)

If (Answer to Q15 = "Mobile Computing") then Q17d

Q17d: De quelle formation plus spécifique auriez-vous besoin dans le domaine "Mobile Computing"?

- Développement IoS
- Développement Android
- Développement Plateforme Universelle Windows
- Développement Multiplateforme (Xamarin, …)
- Conception d'applications mobiles

If (Answer to Q15 = "Distributed Architecture") then Q17e

Q17e: De quelle formation plus spécifique auriez-vous besoin dans le domaine "Architecture Distribuée"?

- Introduction à l'Application Client / Serveur
- Architectures de Services Web (REST, SOAP, …)
- Middleware/Intergiciels pour les Objets Connectés
- Collecte des données dans le Cloud
- Programmation concurrente
- Programmation parallèle

Q18: Quel(s) avantage(s) principal(aux) voyez-vous à exploiter les Objets Connectés au sein de votre entreprise ?

- Analyse des données et Services
- Engagement et Services au client
- Suivi et localisation des biens
- Amélioration des opérations et des procédés
- Automatisation des procédés manuels

Q19: Veuillez citer au moins 3 applications commerciales d'Objets Connectés à proximité de votre propre entreprise. Utilisez des noms de produits (exemple : analyse à base de règles de la production de données basée sur BOSCH – Suite d'Objets Connectés de Systèmes Intégrés

- 3 Fields to answer question

Q20: L'Union Européenne soutient l'adoption commerciale des Objets Connectés par plusieurs programmes. Votre organisation participe-t-elle à l'un de ces programmes ?

- Oui, lequel ?
- Non
- Je ne sais pas

End1:
Nous avons un nombre suffisant de réponses de participants correspondant à votre profil. Merci de votre participation à ce questionnaire.

End2:
Nous vous remercions d'avoir participé à ce questionnaire. Vos réponses vont nous permettre de mieux répondre à vos attentes concernant les Objets Connectés.

Questionario - Italiano

Questo questionario è realizzato nell'ambito del progetto Europeo Erasmus+ "IoT4SMEs" (Internet delle Cose per le Piccole e Medie Imprese), che mira a offrire alle imprese corsi di formazione su Internet delle Cose.
La seguente indagine ha lo scopo di valutare il fabbisogni del mercato del lavoro in materie di Internet delle Cose. Vorremmo raccogliere la Sua opinione, conoscenza ed aspettativa su questo argomento. A questo scopo abbiamo progettato un breve questionario, che richiede non più di 10 minuti. L'analisi delle risposte avrà un ruolo importante per elaborare i corsi di formazione su Internet delle Cose.
La ringraziamo in anticipo per la Sua partecipazione, che ci permetterà di progettare e realizzare corsi di formazione relativi ad Internet delle Cose che meglio soddisfano le aspettative del mercato del lavoro.
Il questionario è anonimo. In ogni caso, i dati forniti saranno trattati con la massima riservatezza.

Q1: In quale paese lavora?

- Italia
- Francia
- Germania
- Lituania
- Portogallo
- Spagna
- Altro paese: quale?

Q2: Quanti impiegati lavorano nella Sua azienda?

- Meno di 10
- Tra 10 e 50
- Tra 50 e 250
- Più di 250

If (Answers to Q2 is not "between 10 and 250") then STOP.

Q3: In quale settore opera la Sua azienda/organizzazione?

- Telecomunicazioni
- ICT
- Consulenza
- Servizi
- Salute
- Commercio
- Manifatturiero
- Alimentare
- Banca e servizi finanziari
- Trasporti / Logistica
- Agricoltura
- Industria
- Altro: quale?

Q4: Quale ruolo ha nella Sua azienda/organizzazione?

- Direttore/Manager
- IT/ICT, Staff o Project Manager
- Progettista (Industria, Prodotti, Servizi)
- Altro: quale?

Q5: È interessato/a all'Internet delle Cose (IoT) per la Sua azienda/organizzazione?

- Si
- No

If (Answer to Q5 = "No") then STOP

Q6: Ha confidenza con le tecnologie basate su Internet delle Cose (IoT)?

- Si
- No

If (Answer to Q6 is "No") then Q7a

Q7a: in che settore sarebbe interessato/a ad acquisire conoscenze/competenze sull'Internet delle Cose (IoT)?

- Informatica
- Data analysis
- Elettronica
- Gestione
- Sicurezza
- Altro: quale?

After Q7a STOP If (Answer to Q6 = "Yes") then Q7b

Q7b: Secondo Lei, cosa meglio definisce l'Internet delle Cose (IoT)? (scegliere da 1 a massimo 4 risposte)

- Cloud Computing
- Protocolli di comunicazione
- Sicurezza informatica
- Computer Vision
- Data Mining, data analytics
- Sistemi Embedded
- Raccolta di dati da sensori
- Machine Learning
- Comunicazione Machine to Machine
- Multiprocessing
- Interconnessioni di rete
- Tag per oggetti (RFID, Beacon, Codici a barre, …)
- Sistemi robotici
- Sensori, Attuatori
- Servizi per l'utente
- Oggetti Smart
- Altro: cosa?

Q8: Lei utilizza/sviluppa "Internet delle Cose" (IoT) nella Sua azienda/organizzazione?

- Si
- No
- No, ma in futuro

If (Answer to Q8 = "Yes") then Q9a

Q9a: Che tipo di IoT utilizza/sviluppa nella Sua azienda/organizzazione?

- Tag per oggetti (RFID, Beacon, Barcode, …)
- Sistemi Embedded
- Protocolli di comunicazione
- Sensori, attuatori
- Acquisizione di dati da sensori

- Oggetti Smart
- Sistemi robotici
- Servizi per l'utente
- Altro: cosa?

If (Answer to Q8 = "No" or "No, but in future") then Q9b

Q9b: Perché non utilizza/sviluppa IoT nella Sua azienda/organizzazione?

- Non conosco i benefici dell'IoT
- IoT non porta benefici alla mia azienda/organizzazione
- L'uso di IoT è troppo complesso
- Ragioni economiche
- Dubbi sulla sicurezza
- Mancanza di compentenze su IoT
- Altro: cosa?

Q10: In che tipo di attività/progetti su "Internet of Things" è coinvolto/a?

- Gestione/Facilitazione
- Creazione/Sviluppo
- Altro: cosa?

If (Answer to Q10 = "Other") then Q7a

Divisione in base al profilo (attività lavorativa):

If (Answer to Q10 = "Manage/Facilitate") then Q11

Direttore, Manager, Progettista

Q11: Quanto ritiene che le seguenti competenze siano rilevanti nella progettazione e implementazione di progetti su IoT (fornisca un punteggio da 0 a 4: 0 non necessarie; 4 essenziali)

- Gestione dei progetti
- Capacità di anticipare le tendenze future
- Gestione dell'innovazione
- Creatività
- Competenze IT (digitali)
- Pensiero analitico
- Altro: cosa?

Q12: Ha l'esigenza personale di sviluppare le seguenti competenze per gestire progetti su IoT (fornisca un punteggio da 0 a 4: 0 non necessarie; 4 essenziali):

- Gestione dei progetti
- Capacità di anticipare le tendenze future
- Gestione dell'innovazione
- Creatività
- Competenze IT (digitali)
- Pensiero analitico
- Altro: cosa?

Q13: Come giudica l'IoT per lo sviluppo del business all'interno della Sua azienda/organizzazione?

- Vorrei comprendere la rilevanza dell'IoT per la mia organizzazione
- Credo che le organizzazioni che sfruttano la IoT avranno un vantaggio significativo
- Credo che la technologia IoT sia pronta per una crescita significativa nei prossimi anni
- Concordo che ci sia molta confusione riguardo all'IoT

Q14: Sarebbe interessato/a a seguire corsi di formazione per gestire progetti su IoT?

- Si
- No
- Non so

Staff IT o ICT

If (Answer to Q10 = "Create/Develop") then Q15

Q15: Ha l'esigenza personale di migliorare le seguenti competenze per sviluppare progetti su IoT (fornisca un punteggio da 0 a 4: 0 non necessario; 4 essenziale):

- Hardware (CPU, uC, SoC, Sensori, Attuatori, ...)
- Sistemi operativi per piattaforme embedded
- Sistemi operativi Real Time
- Robotica
- Comunicazioni, Reti e Protocolli
- Mobile Computing
- Architetture distribuite
- Machine learning per IoT
- Altro: cosa?

Q16: Sarebbe interessato/a a seguire corsi di formazione per sviluppare progetti su IoT?

- Si
- No
- Non so

If (Answer to Q16 = "No " or "I don't know") then STOP

Q17a, Q17b, Q17c, Q17d, Q17e per ottenere dettagli sulle ampie tematiche precedentemente presentate.

If (Answer to Q15 = "Hardware") then Q17a

Q17a: Più nello specifico, di che formazione necessita sull'Hardware?

- Microcontrollori
- Microprocessori
- Sistemi on Chip
- Sensori
- Attuatori
- Progettazione di circuiti
- Consumo di energia
- Analisi dei segnali

If (Answer to Q15 = "Operating Systems") then Q17b

Q17b: Più nello specifico, di che formazione necessita sui Sistemi Operativi per i Sistemi Embedded?

- Panoramica sullo sviluppo embedded e OS
- Programmazione generale del Kernel (Linux)
- Process/Thread e Scheduling
- Sviluppo di Driver
- Gestione della Memoria e del Filesystem
- Sviluppo di applicazioni per sistemi embedded
- Framework per sviluppo embedded (Yocto, OpemEmbedded, ...)

If (Answer to Q15 = "Communication, Network, Protocols") then 17c

Q17c: Più nello specifico, di che formazione necessita sulla Comunicazione, le Reti ed i Protocolli?

- Introduzione alle reti
- Protocolli per reti a bassa potenza e corto raggio (ZigBee, Bluetooth LTE, ...)
- Protocolli per reti a bassa potenza e lungo raggio (LoRa, SigFox, …)
- Protocolli web (HTTP, UPnP, DPWS, ...)
- Protocolli con vincoli temporali (per audio/video, ad esempio)

If (Answer to Q15 = "Mobile Computing") then Q17d

Q17d: Più nello specifico, di che formazione necessita sul Mobile Computing?

- Sviluppo in ambiente IoS
- Sviluppo in ambiente Android
- Sviluppo in ambiente Universal Windows Platform
- Sviluppo multipiattaforma (Xamarin, …)
- Mobile application design/experiences

If (Answer to Q15 = "Distributed Architecture") then Q17e

Q17e: Più nello specifico, di che formazione necessita sull'Architettura Distribuita?

- Introduzione alle applicazioni Client / Server
- Architetture Web Services (REST, SOAP, …)
- Middleware per IoT
- Raccolta di dati nel Cloud
- Programmazione concorrente
- Calcolo parallelo

Q18: Dove vede i maggiori vantaggi nello sfruttare le tecnologie IoT nella Sua organizzazione/azienda?

- Data analytics e servizi
- Servizi per il cliente e coinvolgimento
- Tracciamento degli asset e monitoraggio
- Miglioramento del flusso di lavoro e dei processi
- Automatizzazione dei processi manuali

Q19: Indichi almeno tre applicazioni commerciali IoT disponibili nei pressi della sua azienda/organizzazione. Utilizzi i nomi dei prodotti. Ad esempio: analisi basata su regole dei dati di produzione con sistemi embedded BOSCH – IoT-Suite

- 3 campi in cui rispondere

Q20: L'Unione Europea supporta la diffusione commerciale dell'IoT tramite diverse iniziative. La sua azienda/organizzazione partecipa ad alcune di queste?

- Si: quali ?
- No
- Non so

Finale 1:
Abbiamo già raccolto un numero adeguato di risposte corrispondenti al Suo profilo. La ringraziamo per aver partecipato a questa indagine.

Finale 2:
La ringraziamo per aver partecipato a questa indagine. Le Sue risposte ci aiuteranno a soddisfare al meglio le Sue aspettative circa le tecnologie IoT.

Apklausa - Lietuviškai

Ši apklausa atliekama įgyvendinant tarptautinį Europos Sąjungos finansuojamą Erasmus+ programos projektą “IoT4SMEs” (Daiktų internetas mažoms ir vidutinėms įmonėms), kurio tikslas - suteikti įmonėms vertingą turinį ir mokymų programą daiktų interneto tema.
Apklausos tikslas yra įvertinti, koks šiuo metu yra darbo rinkos poreikis daiktų interneto srityje. Norime sužinoti jūsų nuomonę, poreikius ir turimas žinias šia tema. Šiam tikslui parengėme trumpą apklausą - užtruksite ne ilgiau nei 10 minučių jai užpildyti. Jūsų atsakymų analizė bus panaudota rengiant mokymų programą daiktų interneto tema.
Iš anksto dėkojame už jūsų dalyvavimą apklausoje. Jūsų dalyvavimas mums padės parengti rinkos poreikius atitinkančius mokymus.
Užtikriname, kad visa pateikta informacija liks konfidenciali.

Q1: Kurioje šalyje dirbate?

- Italijoje
- Prancūzijoje
- Vokietijoje
- Lietuvoje
- Portugalijoje
- Ispanijoje
- Kitoje šalyje: kurioje?

Q2: Kiek darbuotojų dirba Jūsų įmonėje?

- Mažiau nei 10
- Nuo 10 iki 50
- Nuo 50 iki 250
- Daugiau nei 250

If (Answers to Q2 is not "between 10 and 250") then STOP.

Q3: Verslo sektorius, kuriame veikia Jūsų įmonė:

- Telekomunikacijos
- ICT
- Konsultacinės paslaugos
- Paslaugos
- Sveikatos apsauga
- Mažmeninė prekyba
- Gamyba
- Maistas
- Bankinės paslaugos
- Transportas/logistika
- Žemės ūkis
- Pramonė
- Kita: ...

Q4: Kokios Jūsų pareigos įmonėje?

- Direktorius/vadovas
- IT/ICT srities darbuotojas/projektų vadovas
- Dizaineris (pramonės, produktų, paslaugų, vartotojo sąsajos)
- Kita: ...

Q5: Ar Jūsų įmonę domina daiktų internetas?

- Taip
- Ne

If (Answer to Q5 = "No") then STOP

Q6: Ar Jūs esate susipažinęs su daiktų internetu?

- Taip
- Ne

If (Answer to Q6 is "No") then Q7a

Q7a: Kurioje srityje norėtumėte vystyti/pagilinti savo žinias/įgūdžius daiktų interneto tema?

- Kompiuterinės technologijos
- Duomenų analizė
- Elektronika
- Vadyba
- Sauga
- Kita: ...

After Q7a STOP If (Answer to Q6 = "Yes") then Q7b

Q7b: Jūsų nuomone, kas geriausiai atspindi terminą "Daiktų internetas"? (galite pasirinkti nuo 1 iki 4 atsakymų)

- Debesų kompiuterija
- Ryšio protokolai
- Kompiuterių apsauga
- Kompiuterinė rega *(angl. Computer Vision)*
- Duomenų rinkimas, analizė
- Įterptinės sistemos
- Duomenų surinkimas iš sensorių
- Sistemos mokymasis *(angl. Machine Learning)*
- Komunikacija tarp sistemų *(angl. Machine to Machine communication)*
- Multiprocesoriškumas *(angl. Multiprocessing)*
- Tinklai *(angl. Networking)*
- Objektų žymėjimas (RFID, Beacon, Barkodas, …)
- Robotikos sistemos
- Jutikliai, vykdikliai *(angl. Actuators)*
- Paslaugos vartotojui
- Išmanūs objektai
- Kita: ...

Q8: Ar Jūs savo versle/įmonėje naudojate daiktų internetą?

- Taip
- Ne
- Ne, bet ketiname naudoti ateityje

If (Answer to Q8 = "Yes") then Q9a

Q9a: Kokio tipo daiktų internetą Jūs naudojate /vystote savo įmonėje?

- Objektų žymėjimą (RFID, Beacon, Barkodas, …)
- Įterptines sistemas
- Ryšio protokolus
- Jutiklius, vykdiklius *(angl. Actuators)*

- Duomenų surinkimą iš sensorių
- Išmanius objektus
- Robotikos sistemas
- Paslaugas vartotojui
- Kita: ...

If (Answer to Q8 = "No" or "No, but in future") then Q9b

Q9b: Kodėl Jūs nenaudojate/nevystote daiktų interneto savo įmonėje?

- Nesu tikras/-a dėl daiktų interneto privalumų ir naudos
- Daiktų internetas mano įmonei neduoda jokios naudos
- Daiktų interneto naudojimas yra per sudėtingas
- Dėl finansinių priežasčių
- Dėl saugumo
- Dėl įgūdžių ir žinių apie daiktų internetą trūkumo
- Kita: ...

Q10: Kokio tipo veiklas/projektus, susijusius su daiktų internetu, vystote ar esate įsitraukęs?

- Valdymo/Procesų optimizavimo
- Kūrimo/vystymo
- Kita: ...

If (Answer to Q10 = "Other") then Q7a

Klausimų paskirstymas priklausomai nuo užimamų pareigų:

If (Answer to Q10 = "Manage/Facilitate") then Q11

Direktorius, vadovas, dizaineris

Q11: Kaip manote, kiek žemiau išvardintos kompetencijos yra būtinos kuriant ir diegiant daiktų internetą (įvertinkite nuo 0 iki 4: 0 - nėra poreikio, 4 - poreikis labai didelis)

- Projektų valdymas
- Sugebėjimas įžvelgti ateities tendencijas
- Inovacijų vadyba
- Kūrybiškumas
- IT (skaitmeninės) kompetencijos
- Analitinis mąstymas
- Kita: ...

Q12: Ar turite asmeninį poreikį vystyti žemiau išvardintas kompetencijas (įvertinkite nuo 0 iki 4: 0 - nėra poreikio, 4 - poreikis labai didelis)

- Projektų valdymas
- Sugebėjimas įžvelgti ateities tendencijas
- Inovacijų vadyba
- Kūrybiškumas
- IT (skaitmeninės) kompetencijos
- Analitinis mąstymas
- Kita: ...

Q13: Kaip vertinate daiktų internetą, kaip galimybę įtakoti Jūsų įmonės rezultatus ateityje?

- Norėčiau sužinoti, kuo daiktų internetas galėtų būti susijęs su mano įmone, būti jai naudingas
- Sutinku, kad įmonės, kurios vysto su daiktų internetu susijusias veiklas, turės žymų pranašumą ateityje
- Manau, kad daiktų interneto ateinančiais metais laukia žymus augimas

- Sutinku, kad kalbant apie daiktų internetą, susiduriama su daug neaiškumo

Q14: Ar norėtumėte dalyvauti mokymuose, kurie suteiktų Jums žinių, kaip valdyti su daiktų internetu susijusius projektus?

- Taip
- Ne
- Nežinau

IT/ICT srities darbuotojas/projektų vadovas

If (Answer to Q10 = "Create/Develop") then Q15

Q15: Ar Jūs asmeniškai jaučiate poreikį patobulinti savo kompetencijas daiktų interneto vystymo srityje (įvertinkite nuo 0 iki 4: 0 - nėra poreikio, 4 - poreikis labai didelis):

- Techninė įranga (CPU, uC, SoC, jutikliai, vykdikliai (*angl. Actuators)*, ...)
- Operacinės sistemos įterptinėms platformoms
- Realaus laiko operacinės sistemos
- Robotika
- Komunikacija, tinklai ir protokolai
- Skaičiavimai mobiliuosiuose įrenginiuose (*angl. Mobile Computing*)
- Paskirstyta architektūra
- Sistemos mokymasis (*angl. Machine learning*) daiktų internetui
- Kita: ...

Q16: Ar norėtumėte dalyvauti mokymuose, kurie suteiktų Jums žinių, kaip vystyti su daiktų internetu susijusius projektus?

- Taip
- Ne
- Nežinau

If (Answer to Q16 = "No " or "I don't know") then STOP

Q17a, Q17b, Q17c, Q17d, Q17e yra skirti gauti detalesnės informacijos apie platesnes temas, pristatytas ankstesniame klausime

If (Answer to Q15 = "Hardware") then Q17a

Q17a: Kokios srities specializuotų mokymų Jūs pageidautumėte tema "Techninė įranga"?

- Mikrokontroleriai
- Mikroprocesoriai
- Vienkristalė sistema (*angl. System on Chip*)
- Jutikliai
- Vykdikliai (*angl. Actuators*)
- Grandinių projektavimas
- Energijos suvartojimas
- Signalų apdorojimas

If (Answer to Q15 = "Operating Systems") then Q17b

Q17b: Kokios srities specializuotų mokymų Jūs pageidautumėte tema "Operacinių sistemų iterptinės platformos"?

- Įterptinių sistemų vystymo apžvalga ir OS
- Įvadas į Kernelio programavimą (Linux)
- Procesai ir procesų planavimas (*angl. Scheduling*)
- Tvarkyklių vystymas
- Atminties ir *failų* sistemos valdymas

- Aplikacijų vystymas įterptinėms sistemoms
- Įterptinių sistemų struktūra (*angl. framework*) (Yocto, OpenEmbedded, ...)

If (Answer to Q15 = "Communication, Network, Protocols") then 17c

Q17c: Kokios srities specializuotų mokymų Jūs pageidautumėte tema "Komunikacija, tinklai ir protokolai"?

- Įvadas į tinkus
- Mažos galios, trumpo nuotolio bevielio ryšio protokolai (ZigBee, Bluetooth LTE, ...)
- Mažos galios, ilgo nuotolio bevielio ryšio protokolai (LoRa, SigFox, …)
- Žiniatinklio protokolai (HTTP, UPnP, DPWS, ...)
- Laiko ribojami protokolai (pavyzdžiui, skirti *audio/video*)

If (Answer to Q15 = "Mobile Computing") then Q17d

Q17d: Kokios srities specializuotų mokymų Jūs pageidautumėte tema "Skaičiavimai mobiliuosiuose įrenginiuose"?

- *iOS* vystymas
- *Android* vystymas
- Universalios *Windows* platformos vystymas
- Multiplatformų vystymas (Xamarin, …)
- Mobilių aplikacijų dizainas

If (Answer to Q15 = "Distributed Architecture") then Q17e

Q17e: Kokios srities specializuotų mokymų Jūs pageidautumėte tema "Paskirstyta architektūra"?

- Įvadas į kliento/serverio aplikacijas
- Žiniatinkliui (*angl. Web*) skirtų paslaugų architektūra (REST, SOAP, …)
- Tarpinė programinė įranga (*angl. Middleware*) daiktų internetui
- Duomenų rinkimas debesyse
- Lygiagretus (*angl. Concurrent*) programavimas
- Paralelinis (*angl. Parallel*) programavimas

Q18: Kaip manote, kuriose srityse Jūsų įmonėje daiktų internetas suteiktų daugiausia pranašumo?

- Duomenų analizė ir paslaugos
- Klientų aptarnavimas ir pritraukimas
- Finansų valdymas ir kontrolė
- Padidintas darbo našumas ir patobulinti procesai
- Procesų automatizavimas

Q19: Prašome, išvardinkite bent tris komercinius daiktų interneto pritaikymo atvejus Jūsų įmonės aplinkoje. Įvardinkite produktus; pavyzdys: taisyklėmis paremta produkcijos duomenų analizė, pagrįsta *BOSCH - IoT Suite* įterptinėmis sistemomis.

- 3 laukai pateikti atsakymams

Q20: Europos Sąjunga įgyvendina keletą programų, kuriomis remia komercinį daiktų interneto pritaikymą. Ar Jūsų įmonė dalyvauja kurioje nors iš šių programų?

- Taip. Kurioje?
- Ne
- Nežinau

End1:
Šiuo metu jau turime pakankamai dalyvių, atitinkančių Jūsų profilį. Ačiū uždalyvavimą apklausoje.

End2:
Labai dėkojame už dalyvavimą apklausoje. Jūsų atsakymai mums padės geriau patenkinti Jūsų su daiktų internetu susijusius poreikius, kuriuos atskleidė ši apklausa.

Questionário - Português

Este questionário é realizado no âmbito do projecto europeu Erasmus + "IoT4SMEs" (Internet das Coisas para Pequenas e Médias Empresas), que visa proporcionar às empresas conteúdos valiosos e formações sobre a Internet das Coisas.
O seguinte questionário tem por objectivo a avaliação das necessidades exigidas pelo mercado da Internet das Coisas. Como tal, gostaríamos de reunir a sua opinião, conhecimento e expectativas acerca deste tópico. Para este propósito, o presente questionário foi criado que não demora mais de 10 minutos a ser concluído. A análise das respostas terão um papel de extrema importância aquando a elaboração de cursos adaptados para formandos na área da Internet das Coisas.
Agradecemos antecipadamente a sua disponibilidade e participação, que irá permitir-nos desenhar e implementar Formações relacionadas com a Internet das Coisas, que irão ao encontro das expectativas do mercado.
Garantimos que a informação será tratada com a máxima confidencialidade.

Q1: Em que país trabalha?

- Italia
- França
- Alemanha
- Lituânia
- Portugal
- Espanha
- Outro país: qual?

Q2: Quantos empregados trabalham na sua empresa?

- Menos de 10
- Entre 10 e 50
- Entre 50 e 250
- Mais de 250

Se (Resposta a Q2 não é "entre 10 e 250"), então PARE.

Q3: Em que setor sua empresa / organização opera?

- Telecomunicação
- TIC
- Consultoria
- Serviços
- Saúde
- Comérico
- Manufactorização
- Alimentação
- Banca
- Transportes / Logistica
- Agricultura
- Indústria
- Outro sector: qual?

Q4: Qual é a sua função de trabalho?

- Director/Gestor
- TI/TIC, Staff ou Gestor de Projectos
- Designer (Industrial, Produto, Serviço, Utilizador experiente)
- Outro: qual?

Q5: Tem interesse na Internet das Coisas (IoT) para o seu negócio / organização?

- Sim
- Não

Se (Resposta a Q5 = "Não") então PARE

Q6: Está familiarizado com a Internet das Coisas (IoT)?

- Sim
- Não

Se (Resposta a Q6 é "Não") então avance para a pergunta Q7a

Q7a: Qual o seu domínio de interesse com o intuito de desenvolver conhecimentos / habilidades para a Internet das Coisas (IoT)?

- Ciência da Computação
- Análise de dados
- Electrónica
- Gestão
- Segurança
- Outro, qual?

No seguimento da pergunta Q7a PARE Se (Resposta a Q6 é "Sim") então avance para a pergunta Q7b

Q7b: Na sua opinião, o que melhor define a Internet das Coisas (IoT)? (escolha 1 a 4 resposta no máximo)

- Computação em Cloud
- Protocolos de Comunicação
- Segurança do computador
- Visão Computacional
- Extracção de dados, análise de dados
- Sistemas incorporados
- Recolha de dados de sensores
- Aprendizagem automática/máquina
- Comunicação Máquina para Máquina
- Multiprocessamento
- Networking
- Sistemas de Marcação (RFID, Beacon, Barcode, …)
- Sistemas robóticos
- Sensores, Atuadores
- Serviços para o utilizador
- Objectos inteligentes
- Outro: qual?

Q8: Usa/desenvolve "Internet das Coisas" (IoT) no seu negócio/organização?

- Sim
- Não
- Não, mas no futuro sim

Se (Resposta a Q8 = "Sim") então avance para a pergunta Q9a

Q9a: Que tipo de IoT usa/desenvolve no seu negócio/organização?

- Marcação de Objectos (RFID, Beacon, Barcode, …)
- Sistemas Incorporados
- Protocolos de Comunicação
- Sensores, Atuadores

- Recolha de dados de sensores
- Objectos Inteligentes
- Sistemas Robóticos
- Serviços para o utilizador
- Outro: qual?

Se (Resposta a Q8 = "Não" ou "Não, mas no futuro sim") então avance para a pergunta Q9b

Q9b: Porque não utiliza/desenvolve IoT no seu negócio/organização?

- Eu não estou ciente dos benefícios de IoT
- IoT não traz benefícios para o meu negócio/organização
- Usar IoT é muito complexo
- Razões financeiras
- Preocupações com segurança
- Falta de habilidades/competencias de IoT
- Outro: qual?

Q10: Que tipo de actividade/projectos relacionadas com "Internet das Coisas" está envolvido?

- Gestão/Facilitador
- Criação/Desenvolvimento
- Outro: qual?

Se (Resposta a Q10 = "Outro") então avance para a pergunta Q7a Ramificação dependendo do perfil (função de trabalho):

Se (Resposta a Q10 = "Gestão/Facilitador") então avance para a resposta Q11

Director, Gestor, Designer

Q11: Acha que as seguintes competências são relevantes para desenvolver e implementar projectos IoT (avalie as suas necessidades de 0 a 4: 0 sem necessidades, altamente necessárias)

- Gestão de Projectos
- Capacidade de antecipar tendências futuras
- Gestão da inovação
- Creatividade
- Competencias TI (digital)
- Pensamento analítico
- Outros, quais?

Q12: Tem necessidades pessoais para desenvolver as seguintes competências, a fim de fazer a gestão de projectos IoT (taxe as suas necessidades de 0 até 4: 0 sem necessidades, altamente necessário):

- Gestão de Projectos
- Capacidade de antecipar tendências futuras
- Gestão da inovação
- Creatividade
- Competencias TI (digital)
- Pensamento analítico
- Outros, quais?

Q13: Como julga a IoT sobre a obtenção de resultados de negócios futuros dentro de sua própria organização?

- Gostaria de aprender sobre a relevância da IoT para a minha organização
- Concordo que as organizações que alavancam a IoT terão uma vantagem significativa
- Eu acho que a IoT está pronta para um crescimento significativo nos próximos anos
- Concordo que há muita confusão em torno da IoT

Q14: Está disposto a beneficiar de provisões de Formação para a gestão de projectos IoT?

- Sim
- Não
- Não sei

TI ou TIC staff

Se (Resposta a Q10 = "Criar/Desenvolver") então avance para a pergunta Q15

Q15: Tem necessidades pessoais para melhorar habilidades ou competências, a fim de desenvolver projectos IoT (taxe as suas necessidades de 0 até 4: 0 sem necessidades, altamente necessário):

- Hardware (CPU, uC, SoC, Sensors, Actuators, ...)
- Sistemas operacionais para plataformas embutidas
- Sistemas operacionais em tempo real
- Robótica
- Comunicação, Networks e Protocolos
- Computação móvel
- Arquitetura distribuída
- Aprendizagem automática para IoT
- Outros, quais?

Q16: Está disposto a beneficiar de provisões de Formação para desenvolver projectos de IoT?

- Sim
- Não
- Não sei

Se (Resposta a Q16 = "Não " ou "Não sei") então PARE

Q17a, Q17b, Q17c, Q17d, Q17e Para obter detalhes sobre os grandes tópicos apresentados acima.

Se (Resposta a Q15 = "Hardware") então avance para a pergunta Q17a

Q17a: Que formação mais específica precisa no domínio de "Hardware"?

- Microcontrolador
- Microprocessador
- Sistema em Chip
- Sensores
- Atuadores
- Design de Circuitos
- Consumo de Energia
- Processamento de sinal

Se (Resposta a Q15 = "Sistemas Operacionais") então avance para a pergunta Q17b

Q17b: Que treino/formação mais específica necessita para o domínio de "Sistemas Operacionais para Sistemas Incorporados"?

- Visão geral do desenvolvimento embutido e do sistema operacional
- Programação Geral do Kernel (Linux)
- Processo/Thread e Agendamento
- Desenvolvimento de drivers
- Gestão de Memória e Arquivos
- Desenvolvimento de aplicações para sistemas embarcados
- Estrutura para Desenvolvimento Incorporado (Yocto, OpemEmbedded, ...)

Se (Resposta a Q15 = "Comunicação, Network, Protocolos") então avance para a pergunta Q17c

Q17c: Qual a Formação mais específica que precisa no domínio "Comunicação, Networks e Protocolos"?

- Introdução à rede
- Protocolos sem fio de baixa potência e de curto alcance (ZigBee, Bluetooth LTE, ...)
- Protocolos sem fio de baixa potência e longo alcance (LoRa, SigFox, …)
- Protocolos Web (HTTP, UPnP, DPWS, ...)
- Protocolos de restrições de tempo (for audio/video for example)

Se (Resposta a Q15 = "Computação Móvel") então avance para a pergunta Q17d

Q17d: Qual a formação mais específica do que você precisa em "computação móvel"?

- Desenvolvimento IoS
- Desenvolvimento Android
- Desenvolvimento da Plataforma Windows Universal
- Desenvolvimento multiplataforma (Xamarin, …)
- Projeto de aplicações móveis/experiências

Se (Resposta a Q15 = "Arquitetura Distribuída") então avance para a pergunta Q17e

Q17e: Qual a formação mais específica do que precisa para "Arquitectura Distribuída"?

- Introdução ao Cliente / Aplicação do Servidor
- Arquiteturas de serviços Web(REST, SOAP, …)
- Middleware para IoT
- Recolha de dados da cloud
- Programação simultânea
- Programação paralela

Q18: Na sua opinião, quais são as maiores vantagens para alavancar a IoT dentro da sua organização?

- Análise e serviços de dados
- Serviços ao cliente e Envolvimento
- Rastreamento de activos e Monitorização
- Melhor fluxo de trabalho e processos
- Processos manuais automatizados

Q19: Indique pelo menos três aplicações IoT comerciais nas proximidades da sua própria organização. Utilizar nomes de produtos; Exemplo: análise baseada em regras de dados de produção baseada em BOSCH - IoT-Suite Embedded systems

- 3 Campos para responder à pergunta

Q20: A União Europeia apoia a adopção comercial da IoT por vários programas. A sua organização participou em algum desses programas?

- Sim, qual ?
- Não
- Não sei

Final 1:
Já temos respostas suficientes de participantes correspondentes ao seu perfil. Obrigado por participar deste inquérito.

Final 2:
Muito obrigado por participar neste inquérito. As suas respostas ajudar-nos-ão a atender melhor as suas expectativas sobre a IoT.