

# EU CODE WEEK 2014

<http://www.euractiv.com/sections/eu-code-week-2014>

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## Coding moves firmly into the mainstream

Once seen as the exclusive province of a handful of computer experts, coding has moved firmly into the mainstream as policymakers, educators and business have realised its potential.

Coding is the language of computers – learn to write it and you will be able to create software, websites, and apps.

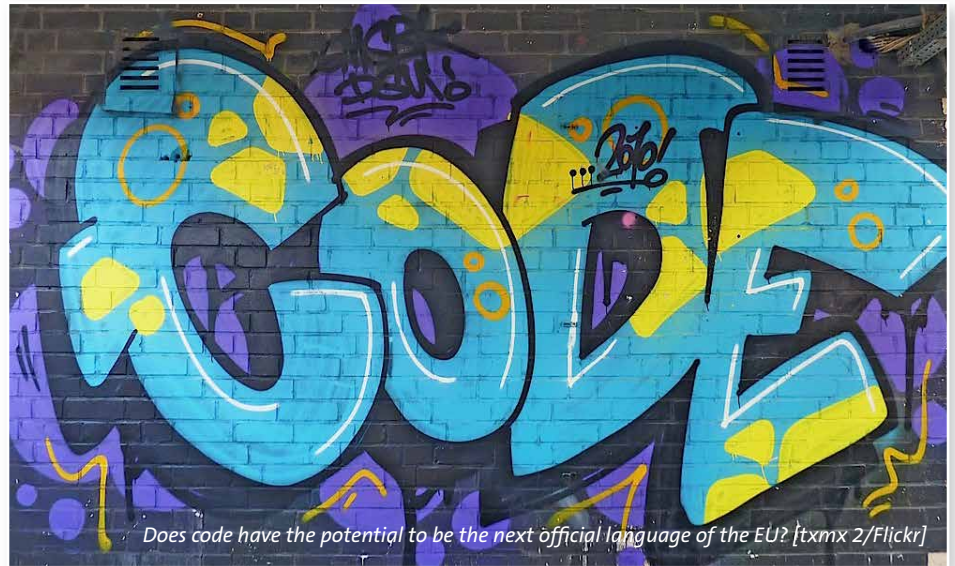
That’s no surprise to many young Europeans, who have grown up with coding and the Internet since birth. But it’s only recently that the older generation has begun to appreciate what benefits it can bring.

Be it employment, the economy, education or entrepreneurship, the creative or just plain fun, coding has a part to play. And it’s an influence national and European policymakers are increasingly aware of, and one that will only become more relevant in the future.

Europe Code Week starts today (13 October). A packed schedule of events, discussion, competitions and debate, it will raise awareness about this vital skill.

Such is the potential of coding that some industry experts argue it should be considered as the newest EU language. It will certainly change the way EU citizens live and work.

Digital Commissioner Neelie Kroes



told EurActiv in an exclusive interview to be published later this week that there will soon be a time when coding comes into everyone’s working life – be they a nurse, for example, or a notary.

“But, she added, “coding is about more than a week, it’s here now and it’s going to be here for our lifetimes.”

Could an economy anchored in code reboot Europe’s return to growth and bring down its unacceptably high unemployment figures?

European Commission research has shown that the job creation potential of an app economy – which can only be created with code - is astonishing.

The EU’s app-developer workforce will grow from one million in 2013 to 2.6 million in 2019. Additional support and marketing staff will take that figure to 4.8 million by 2018.

But is the European Union – so often perceived to be lagging behind the curve in matters digital - going to be ready to take advantage of this cultural transformation?

Will industry and business be able to evolve with the changing demands of a digitised workplace?

How can the skills gap that exists among workers and the unemployed be bridged? What can policymakers do to help?

How can lawmakers encourage people of all ages to embrace and harness the advantages of learning to code?

It’s a tricky question for, in particular, the EU institutions, which have no direct powers over national education systems.

Incoming Vice President for the Digital Single Market Andrus Ansip told MEPs at his confirmation hearing that he wanted coding in the national curriculums of the EU member states.

But as the Commission has no competence in education, they are forced to rely on encouragement and information sharing rather than legislation and regulation.

This is where industry has a vital role to

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play. By joining together with policymakers in public-private partnerships, they can drive awareness-raising and the spread of best practice.

The Coding Industry Coalition of global businesses is the response to that demand. By working together, with EU policymakers, industry is positioning coding in the world of the workplace and education.

Microsoft, Facebook, Angry Birds' creator Rovio, and many more, have decided to launch a European coding platform.

This week, they will throw their weight behind a regional coding movement, aimed at bringing this vital skill firmly into the mainstream.

They are supported by European Schoolnet, which is an EU network of 30 education ministers.

The initiative's aim is to encourage

youngsters to embrace code, and to secure support from national policymakers to make code a core part of the school curriculum across the EU.

Those pupils will be in pole position to make the most of the opportunities that code-conscious youngsters will be offered in the future.

This week, Microsoft is holding the Koda Kup coding competition, the finals of a six month contest for eight to 16-year-olds.

This year's final will bring together eight winning national teams from Portugal, Finland, Norway, UK, Belgium, Greece, Estonia and Lithuania.

Before the competition, there will be a two day coding camp. This intensive training event will furnish Koda Kup finalists with tailored tuition to ensure they can impress the judges.

But, as Kroes pointed out, coding is not a flash in the pan. To fulfill its potential, it

needs to be hardwired across a number of disciplines.

The EU Coding Initiative will establish the first localised coding platform in Europe.

As well as providing teaching and educational resources and raising awareness, the initiative will provide tutorials for every level, from beginner to expert through a new website.

Code.org, the inspiration for the initiative, achieved nearly 1 billion lines of code written by new students since the launch of this global campaign.

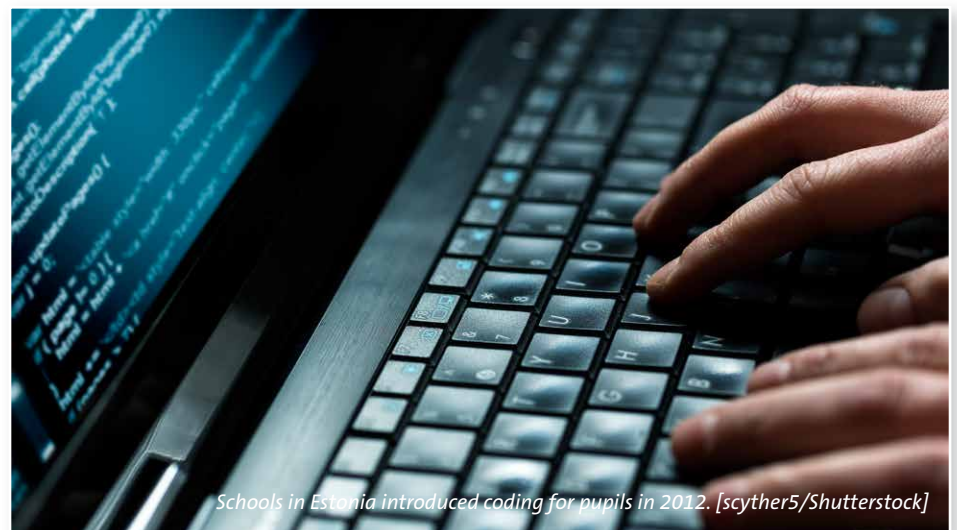
That success was noticed by EU lawmakers, who hope to encourage people of all ages to embrace a language with exceptional potential for the present and even more so for the future.

Over the course of this week, EurActiv will investigate what coding can offer for education, for employment and the future of the EU.

## Five-year-olds learn coding in schools to prepare for future labour market

Learning basic computer programming is becoming mandatory curriculum in primary schools in some member states, as governments try to prepare already digital native pupils the skills they need for the labour markets of the future.

Some German states have introduced coding for high school students while Denmark is considering doing the same. Meanwhile, some schools in Estonia are teaching programming to pupils as young



*Schools in Estonia introduced coding for pupils in 2012. [scyther5/Shutterstock]*

as six.

Just one month ago, schools in Britain started teaching pupils how to program. For children aged five and upwards, coding is now part of the new national curriculum for computing that is being introduced this term.

The British government wants to ensure "that all pupils can understand and apply the fundamental principles and concepts of computer science.

Apart from meeting future needs of businesses and industry, coding in the UK

is also seen as a tool to make pupils think more creatively.

Secondary schools in the UK have already done much of the work, but in primary schools, the teaching has been more 'revolutionary'.

Among the requirements, the five to seven-year-olds have to be taught what algorithms are and how they are implemented as programs on digital devices. They will also be taught how to

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create and debug simple programs and they will learn to use logical reasoning to predict the behaviour of a program.

The curriculum is intended to be flexible so that schools can set up their own lessons, deciding whether to teach children how to make mobile apps, others introducing the Raspberry Pi and similar cheap computing devices.

### Calling up educational ministers

A cross-industry coalition of EU and US technology companies, including Microsoft, Facebook and Rovio, today (14 October) sent an open letter to EU ministers for Education, calling for more computer science education in schools.

“As stewards of Europe’s future generations, you will be all too aware that as early as the age of 7, children reach a critical juncture, when they are learning the core life skills of reading, writing and basic maths. However, to flourish in tomorrow’s digital economy and society, they should be learning to code. And many, sadly, are not,” the coding coalition said in a statement.

The EU has already backed the introduction of coding in schools.

Earlier during the summer, Commissioner for the Digital Agenda Neelie Kroes, and Youth and Education Commissioner Androulla Vassiliou, likewise wrote a letter to the EU’s 28 education ministers, urging them to give every child the opportunity to develop basic coding skills at school.

In the letter, the commissioners said that children in the EU need to be better equipped to work in the digital era. Especially, at a time when youth unemployment is one of Europe’s biggest challenges.

“Coding will also directly help students to develop transversal skills such as analytical thinking, problem solving, team working, and creativity. Starting early means that they will be more inclined to consider computer science studies and ICT related careers,” they wrote.

Commissioner-designate for the Digital Internal Market, Andrus Ansip, also stated during his Commissioner hearing in the European Parliament that coding in schools should be “mandatory”.

## Teachers urged to get on board with coding

Computer coding classes at primary school have to be taught in a more playful way than reading, writing and maths, experts say.

Neelie Kroes, the Dutch EU Commissioner for the Digital Agenda, has called for mandatory coding classes in primary school curricula.

Pupils start learning coding as early as age five in some EU countries but, according to Kroes, one of the future challenges will be to “really get teachers onboard as well”.

Even though children are ready to learn coding at an early age in much the same way they do for math or reading, their teachers are often unable to keep up, she said.

“That’s is something to worry about,” the Commissioner said at the launch of the European Coding Initiative in Brussels on Tuesday (14 October).

“But then I hope that kids will teach



More EU education ministries are considering introducing coding as part of the curriculum in schools. [Ed Yourdon/Flickr]

teachers because they won’t wait until the teacher is ready.”

The European Coding Initiative aims to gather stakeholders to promote coding in all levels of education. Anja Balanskat, senior analyst and project manager at the European Schoolnet, a partnership of European Ministries of Education, agreed with Kroes, stating that one of the future challenges for coding in schools will be to continuously support teachers.

Liam Ryan, managing director for SAP Labs, offered a helping hand by stating that industry can play a part in training new teachers.

“Training is what we do as a company already in training our employees for up to

two years and they are meant to be trainers as well. A number of our employees are willing to volunteer and help coding clubs and within the educational system.”

Creating the coding environment

Mary Moloney, CEO of CoderDojo, a volunteer-led free coding club for young people, said that in order to get pupils engaged, coding needs to have an element of fun despite adding it to a curriculum-based model.

“What you are trying to do is empower children to learn in their own way. It does feel to them like playing. They are creating things that they are in charge of. We should

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have a learning environment where we are not forcing what the output or outcome needs to be because children will create amazing and wonderful things in their own environment,” Moloney said.

The CEO of CoderDojo added that the computer club, which has taught so far 20,000 children across Europe how to code, has even witnessed children age 13-14 create full software solutions for enterprises

## Kroes: Coding can become a world language

Coding is not just for the techies, according to Digital Commissioner Neelie Kroes. It will have an increasingly important role in citizens' everyday lives and that's just one reason to make sure this global “language” is taught to children at school.



Vice-President of the European Union and Commissioner for the Digital Agenda Neelie Kroes. [Neelie Kroes/Flickr]

Neelie Kroes is Vice-President of the European Commission and in charge of the Digital Agenda. She spoke to EurActiv's deputy news editor James Crisp.

and businesses.

Oystein Imsen, a lecturer and Norwegian Code Week ambassador, said that coding doesn't fit into the current curriculum model. He opposed the current way of governing teaching through test results and assessing skills that ‘belong to the old world’.

“We can either go for skills that PISA studies measure, or we can go for the 21st century skills which I think would be a good

**Why is coding important? Does it really merit a whole week?**

It's not just a week, coding is for a whole life. For me it is like writing and reading. We all want everybody to join in with great stuff that makes your world more open, creative, and innovative. With the new technology around these days it makes sense to use coding, this new tool.

You are not only using it, you can play with it as well!

But for this you need the youngsters, the young generation who are born with this in their blood. They can't even imagine not having mobiles, iPads or other devices.

Almost five years ago I created our young advisors group, and they actually appointed our digital champions [leading industry figures in the digital industry].

**Where did the idea for the week come from?**

Well, we were informed about the Microsoft initiative with the US government, which was a huge success. We read about how you can push coding, almost make it a kind of beauty contest, and wanted to do that for our own coding week.

So here, we are; thousands of absolutely fascinating events. It's like a marketing event. Of course we are asking for all the attention for coding this week – but don't stop paying it after a week.

**But people have to learn how to do it...**

It has to be in the curriculums of

idea,” Imsen said.

Manuel Kohnstamm, senior vice president and chief policy officer at Liberty Global, also argued that while coding should be treated as a language and therefore taught at a very early age in order to make pupils fluent, an informal learning environment would be crucial.

“If you put it in a school curriculum it could have some benefits, but it could also be putting some children off,” Kohnstamm said.

schools and it has to be in the mindset of people that it is fun.

There is a difference between boys and girls and their interests in planning their career and educational paths. They have to understand coding is fun and it isn't just for the techies.

**Do you think girls are less interested in coding?**

Some are because they don't know what it is. That's why it is so important to have this coding week to open up mind-sets.

It is not connected with age, it is not connected with colour, it is not connected with gender, and it is for everyone.

But before a certain age, the girls are sometimes even more involved in coding. When they are too young to realise there is meant to be a stigma, it is actually 50-50.

**But a major problem is that teachers may have to learn to code too. It is probably more difficult for them than the children.**

Actually, quite often you do have the children teaching the teachers about coding. There's always one techie in the class, who offers to help!

But it's a fascinating point that you are touching upon. In the future, 90% of jobs will have some relation to digital skills. It is like reading and writing, you need it, some people are using it in a way that is totally different from others. And it doesn't matter about the career; you could be a teacher or a nurse.

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It's not a matter of "are you in favour, yes or no?" it is a fact of life. And that good reason why it needs to be put in the curriculum, made part of children's education.

**When people talk of what you can do with coding, they are essentially talking about apps, aren't they?**

Yes and games. It is giving employment opportunities for people in the EU. But knowing how you can use coding but also how to make it more creative and make it broader is a challenge.

And Europe is the biggest app developer in the world.

**But it is not the most successful app developer in the world...**

I am not that certain. We do have a couple of excellent, very successful companies such as Spotify or Rovio [makers of Angry Birds].

I think that when we give the tools to

people – coding is also a tool – it's up to you if you are making your business out of it or if you are just having fun or so and so forth.

That's why coding should be for everyone. Otherwise I fear it is something for the haves and have not's.

**But the EU has no competence over education. You can only give people the information and let people run with it.**

Education is not our cup of tea, in a way! When we took this initiative I asked [Education Commissioner] Androulla if she was interested in writing to the education ministers and she said yes.

She can't force the ministers to put it in their curriculum. But she can explain why it would be a good idea. So together we are just pushing governments and ministers to be aware that coding is not just a luxury.

You were talking about teachers but the other area is ministers. They have to change the culture too.

**Is this less rules-based approach more popular with member states?**

There's also legislation in the digital portfolio but not for this, not for coding.

For coding it's a lot of talking and pushing and trying to get people out of the way of thinking that this is only for the techies. That, in a way, is the whole Digital Agenda.

This portfolio is creative, it's close to the people, so I can explain it to a 90 year-old person, a six year-old person, entrepreneurs and academics – it's connected to everyone's life.

We also have more than 30 coding ambassadors. They were together in the European Commission. It was such a spirit. Normally people are coming here asking for money or asking to be treated in a certain way but they were saying 'we don't need money' – we need support.

**Could coding become another EU language?**

I sincerely hope it will become a world language, there should be no limitations. It is a language that is remarkably cross-border.

## Digital future: a tale of two Europes

Wide variations in the predicted impact of the digital sector of the future European economy are challenging policymakers' preparation for a radically different jobs market.

Although most experts agree that the digital industries will play a pivotal role in the European economy, academics disagree about the extent and form this will take.

The debate divides broadly between so-called "minimalists" – those who believe little will change – and "maximalists", who



*The digital economy has the potential to spur large quantities of new business.*  
[iStockphoto/Shutterstock]

believe that everything will.

The minimalists believe that we are entering a phase of persistent low economic growth and new technology will cease to be as impactful as in the past.

Economic growth in the US will slow down over the next 30 years, "minimalist"

academic Robert Gordon, a professor at Northwestern University in the US, claimed in an influential paper published this year.

Gordon is sceptical about projections of a boom in economic growth in the

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developed western economies fed by the digital sector.

Another camp claims that economic growth generated by the digital economy will spur large quantities of new business, but that the majority of the resulting jobs will not require technical expertise.

### Look to the past to predict the future

This camp looks back to the technological boom caused by the industrial revolution during the 19th century, pointing out that it shrank the share of specialised jobs, but increased overall output and stimulated peripheral employment sectors.

During that time, as an example, the share of US workers directly employed in farming shrank from 40% to today's one percent. The whole economy expanded and transformed into a modern industrial economy, however, employing more people overall, including many more in the wider food industry.

In the other corner are the so-called "maximalists", who predict a dramatic economic shift arising from the coming of a second "Machine Age", with a corresponding impact on the jobs sector where digital skills will become key.

According to this view, the automation of jobs threatens not just routine mechanised production but also many services sector jobs which require cognitive input.

Recent "maximalist" research by Oxford University has estimated that – based on the current employment market – 47% of US jobs are vulnerable to computerisation.

These jobs are at the low-skill, low-wage end of the labour market as tasks previously hard to computerise in the service sector become vulnerable to technological advance.

Jeremy Bowles – a researcher with think tank Bruegel – applied this Oxford University research to the EU this summer, finding that northern EU countries Netherlands, Belgium, Germany, France, UK, Ireland, and Sweden - have computerisation risk levels similar to the US figure. However eastern and southern EU member states are

even more at risk according to Bowles.

He concluded that in the longer term from around 45% to "well over 60%" of the job markets in these peripheral countries could be affected.

These wide variations in forecasting economic outcomes destabilise policymaking, making it hard to plan for a future that cannot easily be predicted.

### Tricky to make policies for an uncertain future

If sectors traditionally immune to technology – towards the low-skill end of the spectrum – are badly hit, as Bowles predicts, then workers need to be reallocated to less susceptible job sectors. This would be a painful process and involve radical adaptation of education systems.

Seen from a minimalist perspective, less needs to be done from a policymaking perspective.

The EU executive tends towards the maximalist view. For example, research with the support of the Commission's digital unit published this year – Sizing the EU App Economy – found that app developers could quadruple their earnings over the next five years.

An App boom will see profits deriving from apps for consumer goods, banking, media and retail sectors rise from €11.5 billion last year to €46 billion by 2018, according to the research.

The EU executive claims it also considers the economic impact when regulating.

"We have been very aware of the economic impact of regulation – that's why most of what we have done has been grass-roots initiatives and light touch, such as the Grand Coalition for Digital Skills and Jobs; and StartUp Europe – and indeed Code Week EU itself," a spokesman for outgoing digital agenda Commissioner Neelie Kroes says of her term in office.

Over time, the spokesman insists, "we will see their positive effect on the economy" arising from these changes, he says.

Whether he is right will also depend on which side of the maxi/mini debate proves to be correct.

# INFOGRAPHIC: Coding in the classroom

Which EU countries teach coding in the classroom and why? Computing Our Future, a European Schoolnet report, investigated the timetables to find out. 12 countries gave full responses to the survey, the findings of which are summarised in this infographic.

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# Coding in the classroom

< 12 countries responding to the European Schoolnet survey had coding as part of their curriculum >

< Only 3 countries have compulsory coding lessons from primary school onwards >

< 5 countries offer a course dedicated to coding >

< 8 countries offer teacher training in coding >

## Why teach code?

- Fostering logical thinking**
- Fostering problem solving**
- Fostering coding skills**
- Attracting students to computer science**
- Fostering employability in ICT sector**

The main reasoning behind coding in the curriculum was that it fosters logical thinking and problem solving skills. Surprisingly, only half of the countries in the survey cited fostering employability in ICT as a reason for including coding in the curriculum.

