

CRACKING THE CODE BARRIER



In a 2014 study conducted in the United States and the United Kingdom, manufacturing companies lamented the shortage of not manufacturing, but digital talent. The massive demand for advanced technology skills and the near impossibility of fulfillment is a recurrent theme that runs through virtually every industry today. The United States alone will create 1.2 million new jobs in Science, Technology, Engineering, and Math (STEM) fields by 2018, which it will struggle to fill, says a White House initiative called US2020. Likewise, Digital Agenda for Europe, a Europe 2020 initiative under the aegis of the European Commission, predicts their region will fall short of at least 825,000 Information and Communication Technology (ICT) professionals at the end of the decade. Here, it is necessary to clarify that the broad technology domain requires a variety of skills related to STEM qualifications, digital literacy, and code literacy. While they are often bracketed together, in any discussion on talent shortage, STEM qualifications, digital literacy, and code literacy are all different.

Clearly, digital is the new literacy in the job market. With 90 percent of jobs in a long list of fields requiring digital skills in the near future – if they do not already – digital literacy is fast becoming employability hygiene. And as the demand for digital literacy goes up,

derivatively, inevitably, so will the need for code literacy.

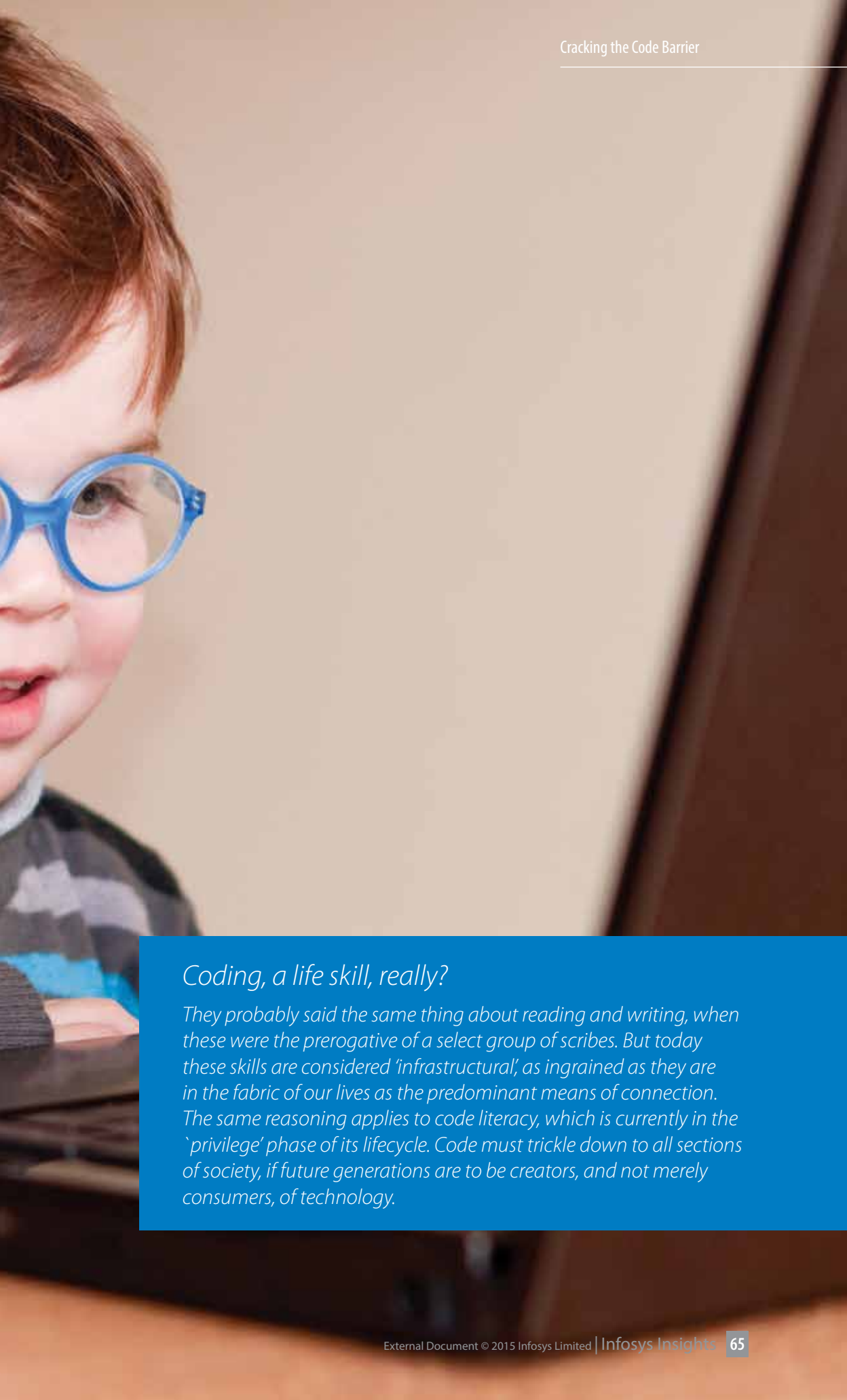
Which is why, it is hard to understand that so little is being done to build this vital skill from an early age. Even as advanced computing has come off its pedestal to become personal, pervading every aspect of day-to-day life, basic computer science – coding, programming, developing – has clung on to remain the esoteric preserve of a few.

In the United States, and likely elsewhere, the relegation of code literacy is rooted in a variety of legacy societal issues, ranging from financial to social to cultural. But now a new narrative is slowly unfolding, scripted by a grassroots movement to build coding awareness and education in the country, made famous by none other than President Obama himself, who even knuckled down to write some. Organizations such as Code.org and The New York Academy of Sciences are working tirelessly with school districts across the country to get them to make coding part of the curriculum, right from the early grades. That apart, they are socializing the need through the 'Hour of Code' campaign, exhorting every American student to spend just one hour trying to learn programming, and organizing events around the Computer Science Education Week, to name a couple.



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Coding, a life skill, really?

They probably said the same thing about reading and writing, when these were the prerogative of a select group of scribes. But today these skills are considered 'infrastructural', as ingrained as they are in the fabric of our lives as the predominant means of connection. The same reasoning applies to code literacy, which is currently in the 'privilege' phase of its lifecycle. Code must trickle down to all sections of society, if future generations are to be creators, and not merely consumers, of technology.

But while the whole idea of improving code literacy may sound simple, it is in fact an enormous agenda. There are huge challenges in execution, ranging from the absence of nationwide harmonized standards for school curricula and a lack of assessment frameworks to a shortage of funding for teacher training and other resourcing and legislative issues. But the biggest challenge by far is changing the people's mindset from 'coding-is-for-geeks' to accepting it as a fundamental skill that can really change lives.

Not just any job, the best job

Hi-tech digital jobs routinely top the listings. Cutting-edge careers are now made in artificial intelligence, data science, robotics, and gaming. Naturally, they also pay better, almost twice the U.S. average, says the Bureau of Labor Statistics. But the closing argument is that soon jobs requiring digital skills will be the only ones available. A list of ten jobs that will soon disappear has only one digital entry, Social Media Manager, at number ten. On the other hand, digital jobs will become more and more fantastic, opening up opportunities to telesurgeons, media remixers, simplicity experts, and robotic counselors.

For those trapped in dead-end jobs at risk of redundancy, the acquisition of coding skills might well mean a new lease of life. For instance, a worker in a traditional assembly line could find himself at the cutting-edge of manufacturing if he learns how 3D printing models and the software used to create them, are built.

Do more, be more

So you don't want to be a programmer? You do not even want a 'science' job. Fair enough. But knowledge of code is still relevant because it enables you to excel at your chosen profession. Or simply, do things more efficiently. Here are some scenarios: Today's filmmaker does pretty much everything from shooting to screening, digitally. Knowing how the software is built would enable her to extract maximum performance from it. Now

think of a sales head in a bank. Familiarity with the code of a corporate banking app would enable him to tell a client whether the customization they were asking for was possible or not, without having to check back with IT. Now cut to the legislative domain, where lawmakers connected with NSA hearings are now expected to understand concepts like encryption.

Essentially, knowledge of software code facilitates a better understanding and appreciation of the working environment surrounding any job involving the use of technology. Code literacy is of higher import than mere computer literacy, because where the latter teaches people how to use digital tools from the outside, the former helps them understand the very same tools from the inside, and thereby exercise greater control over them.

For one and all

The U.S. technology workforce is starkly homogeneous – White or Asian, middle class to affluent, and male. That's because access to computer science education – the pipeline the workforce feeds off – is highly unequal. Data on the U.S. high school AP computer science enrollment says, 15 percent are girls, and about half that, 8 percent, are African American or Hispanic. The reasons for exclusion are, to a large extent, cultural and steeped in stereotypes – "girls can't code", or "it's too hard" and so on. By excluding computer science from their education, vast sections of the population, most of whom are economically and socially disadvantaged, are shutting the door on an attractive computing career and the prospect of upward mobility. Clearly, governments concerned with issues of diversity and inclusion should leverage code literacy as a powerful instrument of that agenda.

Economics

In a recent joint study, two leading analyst firms predicted that digital technologies could add as much as US\$1.36 trillion to the world economy of 2020. While that might

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not be much in itself, the important thing is that digital growth also improves economic growth rates in general. Thus, a 10-point (on a scale of 100) improvement in digital density is likely to accelerate developing economy growth by 50 basis points.

This is why computer science is being hailed as the most important driver of wealth in the post-Industrial Revolution era. Given that wealth is increasingly being generated through Intellectual Property, modern economies that fail to develop the necessary infrastructural computer skills base will soon lag behind.

So, is there a solution in sight?

While it will take years of effort for the code literacy message to sink in within our social and educational systems, the idea is already resonating strongly within the industry community. The technology industry also recognizes the need for throwing its weight behind the code literacy movement. Infosys, for instance, is trying to help the development

of coherent career pathways for kids right from an early age by supporting computer science education in schools and colleges. Infosys Foundation USA is engaging with a number of agencies involved in various related activities, ranging from service delivery and advocacy to research and policy-making.

Such top-down efforts are necessary, but they can only do so much. For the coding literacy needle to move, there needs to be an urgent demand at the grassroots level for computer science education. It is imperative that parents get involved with their local schools and communities to participate in the conversation around the future development of school curricula, and petition the lawmakers to legislate in its favor. They also need to see the bigger picture, that by advocating the recognition of computer science as a core standard, they are not only solving some of the greatest problems of today, but also preparing to meet the challenges and opportunities of tomorrow.

By an Infosys Staff Contributor

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