UbuntuNet CONNECT 2017

Contribution ID: **59**   Type: **Reviewed Presentation**

Growing a Data-Ready Continent: Every Contribution Counts

Friday 3 November 2017 08:40 (20 minutes)

The current acute shortage of computational, data management and analysis skills amongst researchers and practitioners has been described in numerous publications. Programmes have been developed to address this shortage at institutions globally. Interventions aim to provide training in multiple ways, including: short courses, bootcamps, and Massive Open Online Courses. Some "data science"initiatives target people with formal education in computationally fields while other programmes try to upskill applied researchers with limited formal computational and data training.

Despite the availability of all these resources, the growth of data scientific skills and competencies are not keeping pace with the demand for these skills. It is time to think creatively about more rapidly building "data-ready"communities in industries as well as in academia.

Over the past few years, exciting new international initiatives, have emerged. Software, Data, and Library Carpentry are non-profit, volunteer organisations that develop training material, train instructors, organise workshops to teach computing and data skills, and support the development of communities of practice. They have found that mobilising and empowering people at all career stages to share their knowledge with peers offer a simple solution to building skills capacity, thus not depending on large amounts of money or highly ranked government officials or acclaimed professors and experts.

Carpentry workshops teach open-source tools like R, Python, Shell, SQL, OpenRefine, and git to people with little or no prior programming experience. The workshops are typically run over two to three days. Workshop assessment data shows many participants leave workshops with a sense that they too can learn to code and work better with data.

Since 2013 almost 30 Software, Data, and Library Carpentry workshops have run in seven African countries, with many more in the pipeline. These workshops attracted participants from disciplines including life sciences, engineering, health sciences, social sciences and humanities, mathematics and statistics, computer science, as well as support environments like the libraries and IT.

In 2015 the first South African Carpentry instructors participated in online instructor training and four instructors qualified during that year. Two in-person instructor training events were also held in South Africa with a third planned for October 2017. To date, more than 60 African researchers and students have gone through instructor training. These trainees have represented countries including South Africa, Namibia, Zimbabwe, Kenya, Benin, Democratic Republic of Congo, Cameroon, Nigeria, Ethiopia, and Malawi.

The potential to run workshops at a variety of institutions across the continent, is increasing daily through the help of numerous funders, supporters, volunteers, students, researchers, and champions. The entire vision of building computing and data science capacity and communities of practice in Africa, relies entirely on the collaboration across continents, institutions, disciplines, and career stages with reliable internet access playing a crucial role in all of this.

Summary

Since 2013 Software, Data and Library Carpentry workshops have been run in numerous places on the African continent. These workshops teach open-source tools such as R, Python, Shell, git, SQL, and OpenRefine to researchers and students across all disciplines and from all career stages. Through the Carpentry initiatives, more than 60 African instructors have gone through instructor training and hundreds of researchers and

students have learned about tools for data manipulation, analysis and visualisation. This paper will give an overview of the tremendous collaboration across continents, institutions, disciplines, and career stages to build data and computing capacity through the Carpentries in Africa.

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Session Classification: Session 4b - Tracking and Contributing to Intra-African Collaboration in Research and Education

Track Classification: Stimulating intra-African collaboration