A DEEP DIVE INTO ESRI PRODUCTS & SERVICES

ESRI HQ

About

Founded in 1969, and officially known in full as the Environmental Systems Research Institute is an international supplier of geographic information system (GIS) software, web GIS and geodatabase management applications. The company is head-quartered in Redlands, California.

With over 10 regional offices in the US and more than 80 distributors worldwide, ESRI has proved to be one of the most innovative GIS solutions provider since the beginning.

IN THIS ISSUE

- The Pros and Cons

- What products & services?

- The best applications you should start working with within your Organization

- Deployment

- What else does ESRI have to offer?

Who are the competitors?

Alternatives are also available across platforms over the internet. Some of these competitors include:

- Salesforce maps

- Maptitude

- MapInfo

- Google Maps API

- Google Earth Pro

- QGIS

- Carto

To be continued in the next issue...

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Who am I?

A 3rd year Surveying & Geomatics student, Geographic Information Systems Analyst and web applications developer with main interests in the use of GIS in health and Land Administration.

Disclaimer

The views expressed in this publication are those of the author and do not represent an organizations position whatsoever.

What Products & Services?

Commonly known as ArcGIS, the institute has developed quite a number of applications within the Geographic Information Systems (GIS) sector. A number of people are familiar with the ArcGIS for Desktop software which has since been the most used of all. Even when one is beginning to learn the fundamentals of GIS, the first package that is offered to them is usually the desktop software.

Before I knew much, I even thought ArcGIS was the company's name. It only took a few Google clicks and searches to find out what the big organization behind these great tools for work was.

We are just going to list the products and services offered by ESRI below before we get into the main storyline.

- ArcGIS Desktop
- ArcGIS Pro
- AppStudio
- ArcGIS OnlIne
- Dashboards
- Developers
- Experience Builder
- Hub
- Living Atlas
- Map Viewer
- Marketplace
- QuickCapture
- StoryMaps
- Survey123
- Workforce
- Field Maps
- Solutions
- ArcGIS for PowerBi

What are the look-outs and expectations for this software? Learn from the Pros & Cons.

Everything that exists and has been offered comes with its pros and cons. In this issue we are going to be highlighting some of those to shine some lime light and transparency.

When people see products, one thing they ask themselves is the question: Is this really what I need? Can it perform the tasks I intend to do?

One thing for sure is that ArcGIS software has the power to answer all questions that involve the keywords *where* and *what*. Most users like the power it offers for spatial analysis and the data. Quite a number of improvements have been made to strengthen this. We have seen the addition of more python librar-

Source: University of Arizona Libraries

ies and not to leave out the Jupyter Notebooks for analysis that have been added to the Pro version of this software.

Have you also taken some time to look at the Arc Toolbox that comes embedded in the package? Well, if you haven't you are losing out on quite a lot. The software has compelling tools that can help you in all dimensions. Talk about data management to analysis and reporting.

From the Arc Toolbox, it's only a matter of selecting the tool you think is best for the job and use it. Some advanced users would like to implement a few customizations to some of these algorithms to best suit their needs. The Python scripting tool can be of great use if you know your python code very well.

The process of reporting has been made a lot easier by the developers of both Arc-map and ArcGIS Pro. You can simply get a report from the algorithms implemented within your data and attach them to your final reports. The fortunate part is that even errors are reported too. A lot of people make small mistakes when dealing with big software and these are identified by the software therefore letting you know where you need to fix.

The Pros

- Power
- Wide range of tools
- Select & Use
- Reporting
- Advanced stats tools
- Big data? No problem
- Web features
- Continuous development
- Scripting

The Cons

- Doesn't come cheap
- Not open-source
- Requires big hardware
- Complications for starters

A fan of big data? The software will correctly and effectively handle all your large amount of vector and raster data. This is another thing that most Organizations that deal and handle spatial data and information take advantage of.

Big data can not be complete without talking about the statistical component of it. With the ArcGIS software, all you need to do is just decide which tool you want to run, leave the computer to the task and get your results without even thinking of buying that scientific calculator.
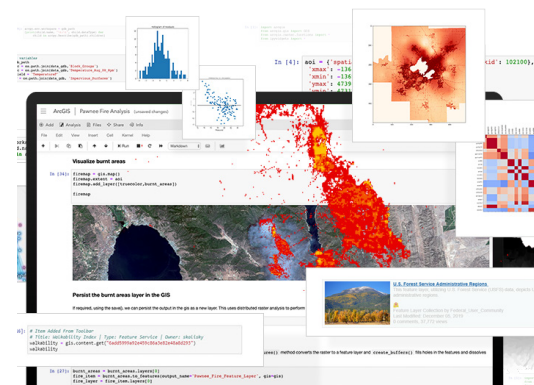
Who hasn't seen maps over web platforms these days? Maps are all over in places that we couldn't even think of. Through the linkage between Arc-map/Pro and ArcGIS Online, users can be able to create maps within the desktop environment, upload these maps to the Online environment and synchronize all changes as they take place. All you need to do is share the web-map or application with the desired audience and all changes that you make within the software can be synchronized in real-time. This is such a great tool when disseminating real-time data. Take for example the COVID-19 pandemic which has seen quite a number of Geo-spatially enhanced applications being developed to track and help spread information to the general public.

The developers at ESRI who are behind the ArcGIS software constantly patch in updates to the software here and there. Unlike in most softwares where they notify you of a new available version but you try to understand the difference between current and new, the ArcGIS software maintains a high standard of upgrades than the rest.

> "
> The application of GIS is limited only by the imagination of those who use it
>
> ## - Jack Dangermond

The power of spatial analysis within ArcGIS Notebooks

Image Source: ESRI

The Downside

As we mentioned before, most of these software packages do not exactly offer our full expectations depending on the job we want to be done. We have listed some of the downfalls of using the ArcGIS software.

Unfortunately, if you do not have much, then there isn't much that you can do. The fact that the software is not entirely open source means that you have to pay in order to get it. An ArcGIS License for a standard user starts from a hundred-dollars (US$100).

The standard user type isn't quite the catch especially if GIS is at the center of your passion. A little more functionality and resources that spice up the work you do will definitely cost you extra.

At one time, I remember getting the Standard user license and I needed to perform some deep spatial analysis only to realize that I needed the spatial-analyst extension in order to do that. Its always good to consult some of the professionals within the industry whenever you are getting software.

Besides getting the software at a higher cost, you also need hardware thats a bit expensive too in order to work effectively and efficiently. From personal experience, working with slow processing machines only slows you down and limits your capacity. At times the program files fail to run and you end up looking for other alternatives which may or may not produce the required outcomes.

With the most recent patches and updates, a minimum of 4GB RAM would do but always make sure no other processes are running in the background while working with that data.

The first thing to do after getting the software is learning. Trying to explore features and work on projects without being familiar with the software will only cause unnecessary complications. A lot of people including myself are not big fans of reading so I usually prefer YouTube tutorials on how to use such kinds of software.

There are two main components within the software, that is the Desktop based and the web-based.

Most of the products and services offered are web-based and mobile hence we are going to be describing these in brief in this Issue.

PRODUCTS & SERVICES IN BRIEF

As seen from the previous list, ESRI offers quite a number of products that we are just going to explain a bit as to what they are.

ArcGIS AppStudio

A low code platform for coding native applications. The App Studio allows you to quickly build applications for distribution in your organization or to publish to any app stores and make them available for public use.
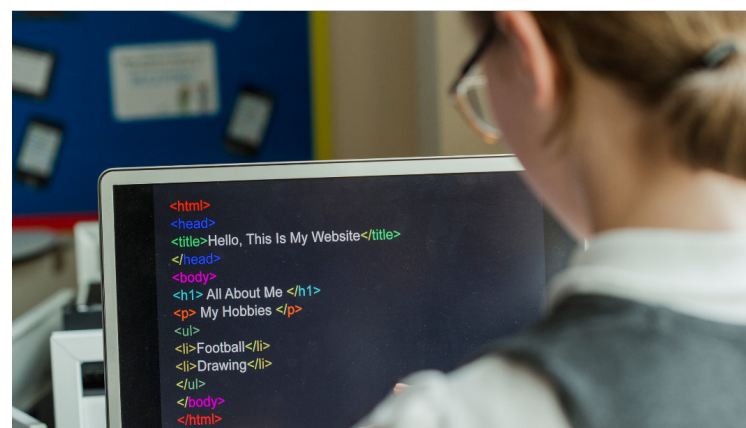
ArcGIS Dashboards

Enables and allows users to convey information by presenting location-based analysis using intuitive and interactive data visualization on a single screen. Have grown popularity during the COVID-19 pandemic with almost all the countries having their own COVID-19 Dashboard for cases and tracking the virus.

ArcGIS for Developers

If you love coding then this one is definitely the right tool for you. ArcGIS for Developers offers a full suite of tools and resources to build mapping and analytics solutions. Use ArcGIS APIs to create location-based applications for web, desktop, and mobile devices.

ArcGIS Experience Builder

ArcGIS Experience Builder empowers you to quickly transform your data into compelling web apps without writing a single line of code. Build map-centric or nonmapcentric apps and display them on a fixed or scrolling screen, on single or multiple pages. Perform a drag-and-drop operation to choose the tools you need from a rich set of widgets, design your own templates, and interact with your 2D and 3D content—all within one app.

ArcGIS Hub

ArcGIS Hub is an easy-to-configure community engagement platform that organizes people, data, and tools through information-driven initiatives. Organizations of any type and any size, including government agencies, nonprofit groups, and academia, can maximize engagement, communication, collaboration, and data sharing using the ArcGIS Hub initiative-based approach.

With the Hub, its more like sharing resources for collaboration through a website where people can also be able to login and interact with the data and applications harnessed within.

This is quite the tool for people who would like to develop a website for GIS applications and other information within the field of GIS but do not really know how.

ArcGIS Living Atlas of the World

This is the world's foremost collection of geospatial information. It comprises of data which is mainly open-source for the public to use. Its components mainly fall under the open-data initiatives. You can easily get satellite imagery, world population and weather information within the Living Atlas.

ArcGIS Marketplace
Provider

The Marketplace is where you can obtain apps and data services from qualified providers, including ESRI and its distributors and partners.
The marketplace stores quite a number of applications. If your organization is looking for a particular application to use, this is the first place you can run to.

ArcGIS Quick Capture, Survey123 & Collector

The reason for combining these three is because they are triplets. They basically have one thing in common which is data collection.
They obviously have their differences which I will dwell much on in another release to come.

Members of the GIS community can simply use these applications to capture data and feed into their hosted layers over the ArcGIS Online platform.

StoryMaps

The power of maps can not be underestimated but with a little story telling within those maps, the message becomes more powerful.

Narrate your stories while using the power of maps to enhance the message within. Be it an outreach or research presentation, with StoryMaps your audience will always love and remember what you tell them.

ArcGIS Workforce

The perfect tool for construction work and maintenance.
It is a mobile app solution that uses the power of location to coordinate your field workforce. It integrates work management to reduce reliance on paper and provides everyone with access to the authoritative data they need. Arc-GIS Workforce is designed to help you reduce errors, boost productivity, and save money.

ArcGIS for Power BI

If Power-Bi was left out of this discussion, then there would be no business at all.

With this integration you can unlock the power of location in your business intelligence. With ArcGIS for Power BI, available inside Microsoft Power BI, create beautiful map...

" **It's easy to put together a story, but it's not nearly as easy to craft top-notch narratives. By keeping these principles in mind, you'll get a good start on the path to greatness.**

"

- Allen Carroll

...Visualizations that surface patterns and trends in your data. Gain context with ArcGIS maps and demographic data. Make better business decisions with ArcGIS for Power BI.

The greatest thing about this tool is that ESRI offers it at no cost at all. All you need to have now is the Power Bi license from the Microsoft team and its a green light for business analytics.

The products that we have described are all web-based packages. Most individuals who start learning GIS are mainly introduced to the Desktop side of the field.

With the personal starter pack, you do not get all the tools at your disposal but it can certainly get you to familiarize with how everything works and operates within a GIS environment.

DEPLOYMENT
Which tools should you implement within your Organization and why?

Forbes has stated that a lot of startups face difficulties within the first 12 months of establishment. Limitations in-terms of resources and getting clients is the first and most difficult experience that a new born baby within the field of Geomatics should overcome.
As most startups, you actually need a starting capital investment in order to sail smoothly. What if I tell you that with the tools we are about to mention you might not even need a lot of money to get started at all especially if you are offering GIS consultancy services?
One good thing that I personally admire about ESRI platforms are their considerations for small business's within their packages.

It is possible to start small and as your income begins to increase, you level up to the industry standards as you go.

Its not only about startups, even large enterprises could leverage these tools but I usually like to dwell much on startups, the rest of the giants usually know how to navigate within the space.

The tool we are going to be discussing is the ArcGIS Online platform which can be leveraged by many Organizations to work effectively and efficiently in modern day GIS structures and workflows.

What is ArcGIS Online? How can an Organization fully utilize it?

With most developments that have taken place lately in the world of technology, a lot of activity is now happening Online. Talk about the growth in e-commerce, e-learning, e-banking, e-governance and all the e-business that you can think of.

Technology has brought about change in the way we do business or even handle ourselves these days and the ArcGIS Online platform is part of that technology.

WebGIS has taken over desktop GIS even though the two

Imagine a platform that gives you the power to connect people, locations and data by using interactive maps. Working with smart, data-driven styles and intuitive analysis tools and being able to share your insights with any intended audience.

Take a look at how medical personnel is able to respond to emergency calls within a short space of time or how the pizza delivery guy ends up by your doorstep without even asking for directions.

ArcGIS Online

With ArcGIS Online you get quite the selection of much needed tools to begin your work with. Most of the tools involved we have mentioned them in Pages 5, 6 and 7. Unfortunately not all of them come with the starter pack, you might have to level up as you go.

First of all to begin with, you should have created an ArcGIS Online to be able to access these tools. The platform comes with a lot of already made configurable applications which you just have to select from and implement within your organization.
The funny thing I noticed about these configurable applications is that they are Open-Source unlike the desktop software packages that they offer. Meaning to say the source code is actually available through the ESRI GitHub pages.

So when creating that ArcGIS Online account, I would recommend you create a **Developer** account as it gives you more functionality and also you do not need to worry about the 28-day trial period.
With the configurable applications being available at your disposal, you have a large pool of over twenty-eight web-based applications that you can select from. These apps are usually put into categories namely, apps for:

- Data collection & editing

- Comparing maps and layers

- 3D visualizations

- Exploring & summarizing data

- Routing and directions

- Making galleries

- Providing local information and

- Story telling in the form of maps

Forget about hiring a web-developer in order to set up an Online site for your organization. You can simply create your own site within the Online Portal and get clients and customers to know more about the services you offer.
The website builder is really easy to configure, its a matter of dragging and dropping widgets depending on the structures that you soo much wish to implement and display.

Thinking of creating something of your own rather that just dragging and dropping templates? The platform also provides that too.

now work closely hand in hand.
Remember the ArcGIS for Developers that we mentioned about earlier on? And the availability of the source codes within the Configurable apps bundle? With a programming background you can get to customize these templates to create applications to suit your style.

Programming can be complicated at times and people tend to run away from it. No need to worry too, the **Experience Builder** has you covered for that. With a wide variety of widgets at your disposal.
From single page web applications, to sliding pages and multiple page applications, your viewers can have the experience they soo much desire through your works.

Big Organization? Try ArcGIS for Enterprise & ArcGIS Server packages.

For non-strartup business, ESRI offers an even better package which comes with more features and your own GIS Server for your organization which you can configure and manage.
With the Enterprise package, you have the power to improve and enhance on location intelligence.

Image Source: ESRI Blog

WHAT ELSE?

Is it always about software and doing business?

No & Yes. Its the power within their software that allows you to carry out your day to day business. Not only are they into business. ESRI also offers Humanitarian aid and relief packages, competitions and trainings.

Recently due to the COVID-19 outbreak, they have offered Corona-virus hub sites for all ArcGIS Online Organization account holders to be able to help spread relevant information and data to members of the community throughout the world. Much of the COVID-19 data and information has been made available in the Living Atlas to enable easy access and sharing...

...of resources across the globe.

Through the ESRI Learning platform, students and professionals can get to enhance their skills and opportunities within the communities they serve by implementing GIS based approaches to problems in around them.

Lastly, always be on the lookout for the ArcGIS StoryMaps Competition that is held annually under a different theme. Recently it was all about the Sustainable Development Goals (SDGs), no wonder what it is going to be this year.
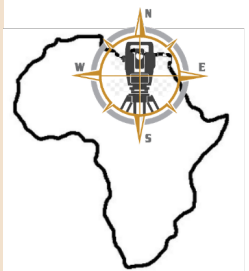
BRIDGING THE BORDERS BETWEEN