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Q.1

- a) **Why we define different needs before taking any task, elaborate your answer.**

Answer

We define different needs before taking any task. The following are the needs to perform Tasks

- A *task statement* is a statement of a highly specific action. It always has a verb and an object. It may have qualifiers, such as “measure distances with a tape measure.” A task statement should not be confused with an *objective* that has conditions and standards
- A task has a definite beginning and end.
- Tasks are performed in relatively short periods of time. They are usually measured in minutes or hours.
- Tasks are observable. By observing the performance of a jobholder, a definite determination can be made that the task has been accomplished.
- Each task is independent of other actions. Tasks are not dependent on components of a procedure. A task is performed by an individual for its own sake.

If we not define different needs before taking a task the following are drawback

Mistake 1: Setting Unrealistic Goals: When you're exploring possible goals, you need to unleash your imagination and ambition, put your reservations aside, and dream big dreams. However, once you've decided on a goal, make sure that it is realistic, and that you can actually achieve it in the time frame that you have set for yourself.

Mistake 2: Focusing on Too Few Areas So: when you set your goals, make sure that you strike the right balance between different areas of your life. And remember that "balance" is different for everyone – use the [Wheel of Life](#) tool to understand which areas of your life you need to focus on most.

Mistake 3: Underestimating Completion Time: How often has a task or project taken longer than you thought? Probably more times than you can count! You may also say the same for goals that you've set in the past.

If you don't estimate goal completion time accurately, it can be discouraging when things take longer to achieve than you think they should. This can cause you to give up.

Mistake 4: Not Appreciating Failure: No matter how hard you work, you will fail to achieve goals from time to time. We've all been there, and it isn't fun! However, your failures are what ultimately determine your character. They also contain lessons that can change your life for the best, if you have the courage to learn from them. So don't be too upset if you fail to achieve your goals – just take note of where you went wrong and use that knowledge to reach your goals next time around.

Mistake 5: Setting "Other People's Goals": People – family, friends, or even your boss – may want to influence the goals you set. Perhaps they feel that they know what's best for you, or maybe they want you to take a certain path or do certain things.

Clearly, it's important that you have good relationships with these people, and you need to do what your boss asks, within reason.

However, your goals need to be your own – not anybody else's.

Mistake 6: Not Reviewing Progress: It takes time to accomplish goals. And sometimes it can feel that you aren't making much progress.

This is why it's important to take stock of everything that you've accomplished on a regular basis. Set small sub-goals, celebrate your successes, and analyze what you need to do to keep moving forward. No matter how slow things seem, you probably are making progress!

You can also take this opportunity to update your goals, based on what you've learnt.

Elaboration :-

So due above advantages and disadvantages the result out that from every task, Business and job applying we should know that we will successfully if we have a well define planning for that purpose so planning is the essential and part the success of any task, business and to getting job.

“So from every beginning of any task we should have a pre define planning if we want to success”

Question # 1

Part (b)

What information is required if a person is thinking to start a specific business, also discuss different sources of information.

Answer:

The following are the 10 formation is required if a person is thinking to start a specific business.

1. Evaluate yourself:

Let's start with the most basic question: Why do you want to start a business? Use this question to guide what kind of business you want to start. If you want extra money, maybe you should start a side hustle. If you want more freedom, maybe it's time to leave your 9-to-5 job and start something new.

Once you have the reason, start asking yourself even more questions to help you figure out the type of business you should start, and if you have what it takes.

- What skills do you have?
- Where does your passion lie?
- Where is your area of expertise?
- How much can you afford to spend, knowing that most businesses fail?
- How much capital do you need?
- What sort of lifestyle do you want to live?
- Are you even ready to be an entrepreneur?

Be brutally honest with your answers. This will create a foundation for everything you do moving forward, so it's better to know the truth now than later.

2. Think of a business idea:

Do you already have a killer business idea? If so, congratulations! You can proceed to the next section. If not, there are a ton of ways to start brainstorming for a good idea. An article on *Entrepreneur*, "8 Ways to Come Up With a Business Idea," helps people break down potential business ideas. Here are a few pointers from the article:

Ask yourself what's next. What technology or advancement is coming soon, and how will that change the business landscape as we know it? Can you get ahead of the curve?

Fix something that bugs you. People would rather have less of a bad thing than more of a good thing. If your business can fix a problem for your customers, they'll thank you for it.

Apply your skills to an entirely new field. Many businesses and industries do things one way because that's the way they've always been done. In those cases, a fresh set of eyes from a new perspective can make all the difference.

Use the better, cheaper, faster approach. Do you have a business idea that isn't completely new? If so, think about the current offerings and focus on how you can create something better, cheaper or faster.

3. Do market research:

Start researching your potential rivals or partners within the market by using this guide. It breaks down the objectives you need to complete with your research and the methods you can use to do just that. For example, you can conduct interviews by telephone or face to face. You can also offer surveys or questionnaires that ask questions like “What factors do you consider when purchasing this product or service?” and “What areas would you suggest for improvement?”

Just as importantly, it explains three of the most common mistakes people make when starting their market research, which are:

1. Using only secondary research.
2. Using only online resources.
3. Surveying only the people you know

4. Get feedback:

Let people interact with your product or service and see what their take is on it. A fresh set of eyes can help point out a problem you might have missed. Plus, these people will become your first brand advocates, especially if you listen to their input and they like the product. Here are six steps for handling feedback:

1. **Stop!** Your brain will probably be in an excited state when receiving feedback, and it might start racing to bad conclusions. Slow down and take the time to consider carefully what you've just heard.
2. **Start by saying ‘thank you.’** People who give you negative feedback won't expect you to thank them for it, but doing so will probably make them respect you and encourage them to continue be honest in the future.
3. **Look for the grain of truth.** If someone doesn't like one idea, it doesn't mean they hate everything you've just said. Remember that these people are trying to help, and they might just be pointing out a smaller problem or solution that you should look into further.
4. **Seek out the patterns.** If you keep hearing the same comments, then it's time to start sitting up and taking notice.
5. **Listen with curiosity.** Be willing to enter a conversation where the customer is in control.
6. **Ask questions.** Figure out why someone liked or didn't like something. How could you make it better? What would be a better solution?

5. Make it official:

Get all of the legal aspects out of the way early. That way, you don't have to worry about someone taking your big idea, screwing you over in a partnership or suing you for something you never saw coming. A quick checklist of things to shore up might include:

1. Business structure (LLC, corporation or a partnership, to name a few.)
2. Business name
3. Register your business

4. Federal tax ID
5. State tax ID
6. Permits
7. License
8. Necessary bank account
9. Trademarks, copyrights or patents

6. Write your business plan:

A business plan is a written description of how your business will evolve from when it starts to the finish product.

Here's what we suggest should be in your business plan:

1. **Title page.** Start with name the name of your business, which is harder than it sounds. This article can help you avoid common mistakes when picking.
2. **Executive summary.** This is a high-level summary of what the plan includes, often touching on the company description, the problem the business is solving, the solution and why now. (Here's what you should include in the summary and how you can make it appeal to investors.)
3. **Business description.** What kind of business do you want to start? What does your industry look like? What will it look like in the future?
4. **Market strategies.** What is your target market, and how can you best sell to that market?
5. **Competitive analysis.** What are the strengths and weakness of your competitors? How will you beat them?
6. **Design and development plan.** What is your product or service and how will it develop? Then, create a budget for that product or service.
7. **Operations and management plan.** How does the business function on a daily basis?
8. **Finance factors.** Where is the money coming from? When? How? What sort of projections should you create and what should you take into consideration?

7. Finance your business:

There are a ton of different ways to get the resources you need to start your business:

1. **Fund your startup yourself.** Bootstrapping your business might take longer, but the good part is that you control your own destiny (and equity).
2. **Pitch your needs to friends and family.** It can be hard to separate business from personal relationships, but if you're considering asking for a loan, here's a resource you can use to make it as straightforward as possible.
3. **Request a small-business grant.** Start by checking out our guide to small-business grants. Then, head over to Grants.gov, which is a searchable, online directory of more than 1,000 federal grant programs. It might be a long process, but it doesn't cost you any equity.

4. **Start a crowdfunding campaign online.** Sometimes power is in numbers, and a bunch of small investments can add up to something major. If you think your business might be a fit for something like Kickstarter or Indiegogo, you should read up on 10 of the best-crowdfunded businesses ever or check out the [most popular crowdfunding websites](#).

5. **Apply to local angel investor groups.** Online platforms such as Gust and AngelList and local networking can help you find potential investors who relate to your industry and passion.

6. **Solicit venture capital investors.** VCs typically look for big opportunities from proven teams that need a million dollars or more, so you should have some traction before approaching them.

8. Develop your product or service:

After all the work you've put into starting your business, it's going to feel awesome to actually see your idea come to life. But keep in mind, it takes a village to create a product. If you want to make an app and you're not an engineer, you will need to reach out to a technical person. Or if you need to mass-produce an item, you will have to team up with a manufacturer.

When you are ready to do product development and outsource some of the tasks make sure you:

1. **Retain control of your product and learn constantly.** If you leave the development up to someone else or another firm without supervising, you might not get the thing you envisioned.
2. **Implement checks and balances to reduce your risk.** If you only hire one freelance engineer, there's a chance that no one will be able to check their work. If you go the freelance route, use multiple engineers so you don't have to just take someone at their word.
3. **Hire specialists, not generalists.** Get people who are awesome at the exact thing you want, not a jack-of-all-trades type.
4. **Don't put all your eggs in one basket.** Make sure you don't lose all of your progress if one freelancer leaves or if a contract falls through.
5. **Manage product development to save money.** Rates can vary for engineers depending on their specialties, so make sure you're not paying an overqualified engineer when you could get the same end result for a much lower price.

9. Start building your team:

To scale your business, you are going to need to hand off responsibilities to other people. You need a team.

Whether you need a partner, employee or freelancer, these three tips can help you find a good fit:

1. **State your goals clearly.** Make sure everyone understands the vision and their role within that mission at the very start.
2. **Follow hiring protocols.** When starting the hiring process you need to take a lot of things into consideration, from screening people to asking the right questions and having the proper forms. Here is a more in-depth guide to help you.
3. **Establish a strong company culture.** What makes a great culture? What are some of the building blocks? You can see our list of 10 examples of companies with great cultures, but keep in mind that you don't need to have Google's crazy office space to instill a positive atmosphere. That's because a great culture is more about respecting and empowering employees through multiple channels, including training and mentorship, than it is about decor or ping-pong tables. In fact, office perks can turn out to be *more like traps than real benefits*.

10. Find a location:

This could mean an office or a store. Your priorities will differ depending on need, but here are 10 basic things to consider:

1. **Style of operation.** Make sure your location is consistent with your particular style and image.
2. **Demographics.** Start by considering who your customers are. How important is their proximity to your location? If you're a retail store that relies on the local community, this is vital. For other business models, it might not be.
3. **Foot traffic.** If you need people to come into your store, make sure that store is easy to find. Remember: even the best retail areas have dead spots.
4. **Accessibility and parking.** Is your building accessible? Don't give customers a reason to go somewhere else because they don't know where to park.
5. **Competition.** Sometimes having competitors nearby is a good thing. Other times, it's not. You've done the market research, so you know which is best for your business.
6. **Proximity to other businesses and services.** This is more than just about foot traffic. Look at how nearby businesses can enrich the quality of your business as a workplace, too.
7. **Image and history of the site.** What does this address state about your business? Have other businesses failed there? Does the location reflect the image you want to project?
8. **Ordinances.** Depending on your business, these could help or hinder you. For example, if you're starting a daycare center, ordinances that state no one can build a liquor store nearby might add a level of safety for you. Just make sure you're not the one trying to build the liquor store.
9. **The building's infrastructure.** Especially if you're looking at an older building or if you're starting an online business, make sure the space can support your high-tech needs. If you're getting serious about a building, you might want to hire an engineer to check out the state of the place to get an objective evaluation.
10. **Rent, utilities and other costs.** Rent is the biggest facilities expense, but check out the utilities, as well, and whether they're included in the lease or not. You don't want to start out with one price and find out it's going to be more later

Different Sources of Information

In general, there are three types of resources or sources of information: primary, secondary, and tertiary.

1. **Primary sources** are original materials on which other research is based, including:
 - original written works – poems, diaries, court records, interviews, surveys, and original research/fieldwork, and
 - research published in scholarly/academic journals.
2. **Secondary sources** are those that describe or analyze primary sources, including:
 - reference materials – dictionaries, encyclopedias, textbooks, and
 - books and articles that interpret, review, or synthesize original research/fieldwork.
3. **Tertiary sources** are those used to organize and locate secondary and primary sources.
 - Indexes – provide citations that fully identify a work with information such as author, titles of a book, article, and/or journal, publisher and publication date, volume and issue number and page numbers.
 - Abstracts – summarize the primary or secondary sources,
 - Databases – are online indexes that usually include abstracts for each primary or secondary resource, and may also include a digital copy of the resource

Sources by which we get information

- Books.
- Encyclopedias.
- Magazines.
- Databases.
- Newspapers.
- Library Catalog.
- Internet.

Question # 3:

What is organization? Explain different types of organization in detail.

Answer:

Organization: An **organization** is an entity comprising multiple people, such as an institution or an association, that has a particular purpose.

The word is derived from the Greek word *organon*, which means tool or instrument, musical instrument, and organ.

Different types of Organization

1. Corporation

A **corporation** is an organization—usually a group of people or a company—authorized by the state to act as a single entity (a legal entity; a legal person in legal context) and recognized as such in law for certain purposes. Early incorporated entities were established by charter (i.e. by an *ad hoc* act granted by a monarch or passed by a parliament or legislature).

Most jurisdictions now allow the creation of new corporations through registration.

Corporations come in many different types but are usually divided by the law of the jurisdiction where they are chartered based on two aspects: by whether they can issue stock, or by whether they are formed to make a profit. Corporations can be divided by the number of owners: corporation aggregate or corporation sole. The subject of this article is a corporation aggregate. A corporation sole is a legal entity consisting of a single ("sole") incorporated office, occupied by a single ("sole") natural person.

Where local law distinguishes corporations by the ability to issue stock, corporations allowed to do so are referred to as "stock corporations", ownership of the corporation is through stock, and owners of stock are referred to as "stockholders" or "shareholders". Corporations not allowed to issue stock are referred to as "non-stock" corporations; those who are considered the owners of a non-stock corporation are persons (or other entities) who have obtained membership in the corporation and are referred to as a "member" of the corporation.

Corporations chartered in regions where they are distinguished by whether they are allowed to be for-profit are referred to as "for-profit" and "not-for-profit" corporations, respectively.

2. Government

A **government** is the system or group of people governing an organized community, often a state.

In the case of its broad associative definition, government normally consists of legislature, executive, and judiciary. Government is a means by which organizational policies are enforced, as well as a mechanism for determining policy. Each government has a kind of constitution, a statement of its governing principles and philosophy. Typically the philosophy chosen is some balance between the principle of individual freedom and the idea of absolute state authority (tyranny).

While all types of organizations have governance, the word *government* is often used more specifically to refer to the approximately 200 independent national governments on Earth, as well as subsidiary organizations.

Historically prevalent forms of government include monarchy, aristocracy, timocracy, oligarchy, democracy, theocracy and tyranny. The

main aspect of any philosophy of government is how political power is obtained, with the two main forms being electoral contest and hereditary succession.

Libertarianism and anarchism are political ideologies that seek to limit or abolish government, finding government disruptive to self-organization and freedom.

3. Non-governmental organization:

Organizations that are independent of any government's involvement are called **Non-governmental organizations**. These organizations are also known as NGOs or **non-government organizations**. NGOs are usually non-profitable. Many of them are active in the areas of humanitarian or social sciences. However, NGOs can also be lobby groups for corporations, such as the World Economic Forum.

NGOs are a subgroup of all organizations founded by citizens, which include clubs and other associations that provide services, benefits, and premises only to its members: Sometimes the term is used as a synonym for civil society organizations as recorded by dictionaries, referring to any association founded by citizens, as opposed to how the media or everyday language expresses it.

The explanation of the term by NGO.org (the non-governmental organizations associated with the United Nations) is ambivalent: "[an NGO is] any non-profit, voluntary citizens' group which is organized on a local, national or international level," but then goes on to restrict the meaning in the sense used by most English speakers and the media: "Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bring citizen concerns to Governments, advocate and monitor policies and encourage political participation through provision of information.

4. Political organization

A political organization is any organization that involves itself in the political process, including political parties, non-governmental organizations, advocacy groups and special interest groups. Political organizations are those engaged in political activities (e.g., lobbying, community organizing, campaign advertising, etc.) aimed at achieving clearly-defined political goals, which typically benefit the interests of their members.

While parties are one type of political organization that may engage in some or all of those activities, they are distinct in that they typically focus on supporting candidates for public office, winning elections and controlling government.

5. International organization

An international organization (intergovernmental organization) is an organization established by a treaty or other instrument governed by international law and possessing its own international legal personality, such as the United Nations, the World Health Organization and NATO.^{[2][3]} International organizations are composed of primarily Member states, but may also include other entities, such as other international organizations. Additionally, entities (including, but not limited to states) may hold observer status.

Notable examples include the United Nations (UN), Organization for Security and Co-operation in Europe (OSCE), Council of Europe (COE), International Labor Organization (ILO) and International Police Organization (INTERPOL).

6. Nonprofit organization

A **nonprofit organization (NPO)**, also known as a **non-business entity, not-for-profit organization, or nonprofit institution**, is an organization dedicated to furthering a particular social cause or advocating for a shared point of view. In economic terms, it is an organization using its surplus of the revenues to further achieve its ultimate objective, rather than distributing its income to the organization's shareholders, leaders, or members. Nonprofits are tax-exempt or charitable, meaning they do not pay income tax on the money that they receive for their organization. They can operate in religious, scientific, research, or educational settings.

The key aspects of nonprofits are accountability, trustworthiness, honesty, and openness to every person who has invested time, money, and faith into the organization. Nonprofit organizations are accountable to the donors, founders, volunteers, program recipients, and the public community. Public confidence is a factor in the amount of money that a nonprofit organization is able to raise. The more nonprofits focus on their mission, the more public confidence they will have, and as a result, more money for the organization. The activities a nonprofit is partaking in can help build the public's confidence in nonprofits, as well as how ethical the standards and practices are.

7. Partnership Organization

A **partnership** is an arrangement where parties, known as business partners, agree to cooperate to advance their mutual interests. The partners in a partnership may be individuals, businesses, interest-based organizations, schools, governments or combinations. Organizations may partner to increase the likelihood of each achieving their mission and to amplify their reach. A partnership may result in issuing and holding equity or may be only governed by a contract.

8. Secret society

A **secret society** is a club or an organization whose activities, events, inner functioning, or membership are concealed from non-members. The society may or may not attempt to conceal its existence. The term usually excludes covert groups, such as intelligence agencies or guerrilla warfare insurgencies, that hide their activities and memberships but maintain a public presence.

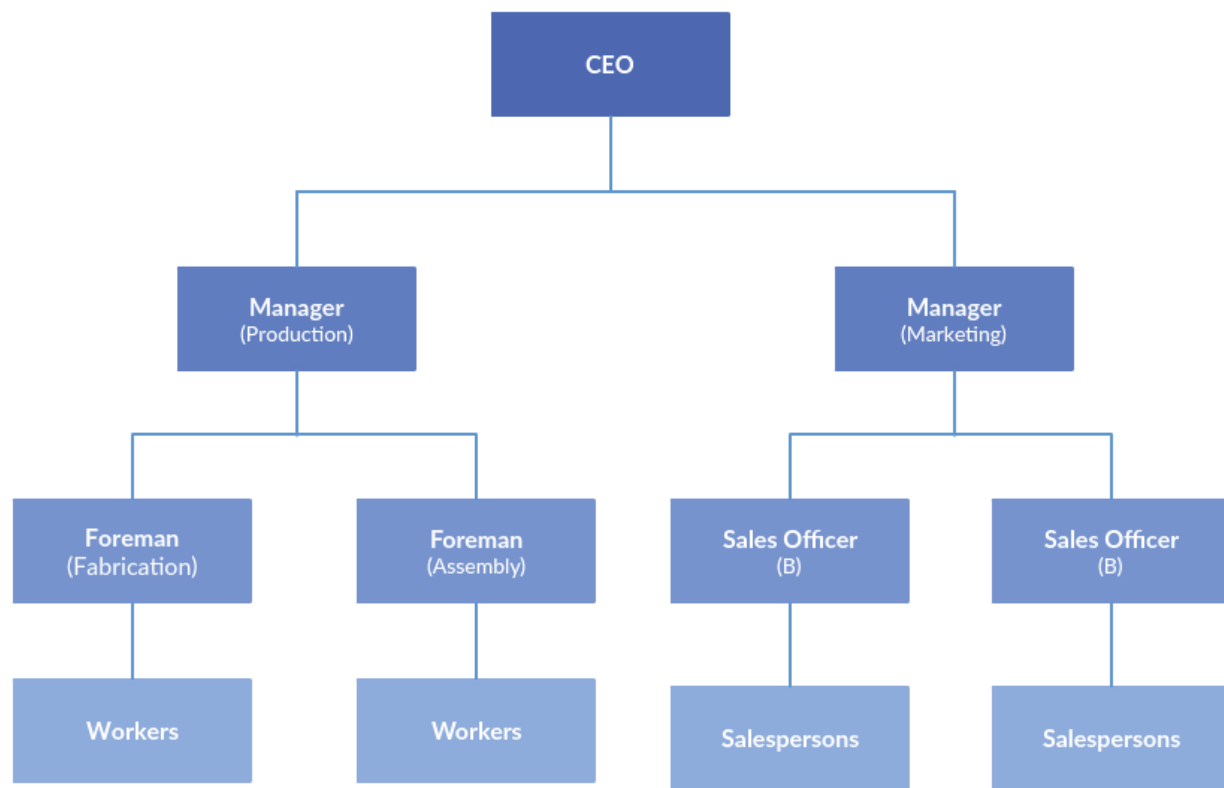
9. crime organization

Organized crime is a category of transnational, national, or local groupings of highly centralized enterprises run by criminals to engage in illegal activity, most commonly for profit. Some

criminal organizations, such as terrorist groups, are politically motivated. Sometimes criminal organizations force people to do business with them, such as when a gang extorts money from shopkeepers for "protection". Gangs may become disciplined enough to be considered organized. A criminal organization or gang can also be referred to as a mafia, mob, ring, or syndicate the network, subculture and community of criminals may be referred to as the underworld. European sociologists (e.g. Diego Gambetta) define the "mafia" as a type of organized crime group that specializes in the supply of extra-legal protection and quasi law enforcement. Gambetta's classic work on the original "Mafia", or the Sicilian Mafia, generates an economic study of the mafia, which exerts great influence on studies of the Russian mafia, the Chinese triads, Hong Kong mafia and the Japanese yakuza.

10. Resistance movement organization

A **resistance movement** is an organized effort by some portion of the civil population of a country to withstand the legally established government or an occupying power and to disrupt civil order and stability. It may seek to achieve its objectives through either the use of nonviolent resistance (sometimes called civil resistance), or the use of force, whether armed or unarmed. In many cases, as for example in Norway in the Second World War, a resistance movement may employ both violent and non-violent methods, usually operating under different organizations and acting in different phases or geographical areas within a country.



Question NO# 3

What are the difference between Data and Information? Give detail with proper examples and explanations.

Answer:

Data: Data are characteristics or information, usually numerical, that are collected through observation. In a more technical sense, data is a set of values of qualitative or quantitative variables about one or more persons or objects, while a datum (singular of data) is a single value of a single variable.

Explanation

Although the terms "data" and "information" are often used interchangeably, these terms have distinct meanings. In some popular publications, data is sometimes said to be transformed into information when it is viewed in context or in post-analysis.[3] In academic treatments of the subject, however, data are simply units of information. Data is employed in scientific research, businesses management (e.g., sales data, revenue, profits, stock price), finance, governance (e.g., crime rates, unemployment rates, literacy rates), and in virtually every other form of human organizational activity (e.g., censuses of the number of homeless people by non-profit organizations).

Data is measured, collected and reported, and analyzed, whereupon it can be visualized using graphs, images or other analysis tools. Data as a general concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing. Raw data ("unprocessed data") is a collection of numbers or characters before it has been "cleaned" and corrected by researchers. Raw data needs to be corrected to remove outliers or obvious instrument or data entry errors (e.g., a thermometer reading from an outdoor Arctic location recording a tropical temperature). Data processing commonly occurs by stages, and the "processed data" from one stage may be considered the "raw data" of the next stage. Field data is raw data that is collected in an uncontrolled "in situ" environment. Experimental data is data that is generated within the context of a scientific investigation by observation and recording.

Data has been described as the new oil of the digital economy.

Types of Data

1 - Big data:

A core favorite, big data has arisen to be defined as something like: that amount of data that will not practically fit into a standard (relational) database for analysis and processing caused by the huge volumes of information being created by human and machine-generated processes.

2 - Structured, unstructured, semi-structured data

All data has structure of some sort. Delineating between structured and unstructured data comes down to whether the data has a pre-defined data model and whether it's organized in a pre-defined way.

Mat Keep is senior director of products and solutions at MongoDB. Keep explains that, in the past, data structures were pretty simple and often known ahead of data model design -- and so data was typically stored in the tabular row and column format of relational databases.

3 - Machine data

Simply put, machine data is the digital exhaust created by the systems, technologies and infrastructure powering modern businesses.

Matt Davies, head of EMEA marketing at Splunk asks us to paint a picture and imagine your typical day at work, driving to the office in your connected car, logging on to your computer, making phone calls, responding to emails, accessing applications. Davies explains that all this activity creates a wealth of machine data in an array of unpredictable formats that is often ignored.

4 - Open data

Open data is data that is freely available to anyone in terms of its use (the chance to apply analytics to it) and rights to republish without restrictions from copyright, patents or other mechanisms of control. The Open Data Institute states that open data is only useful if it's shared in ways that people can actually understand. It needs to be shared in a standardized format and easily traced back to where it came from.

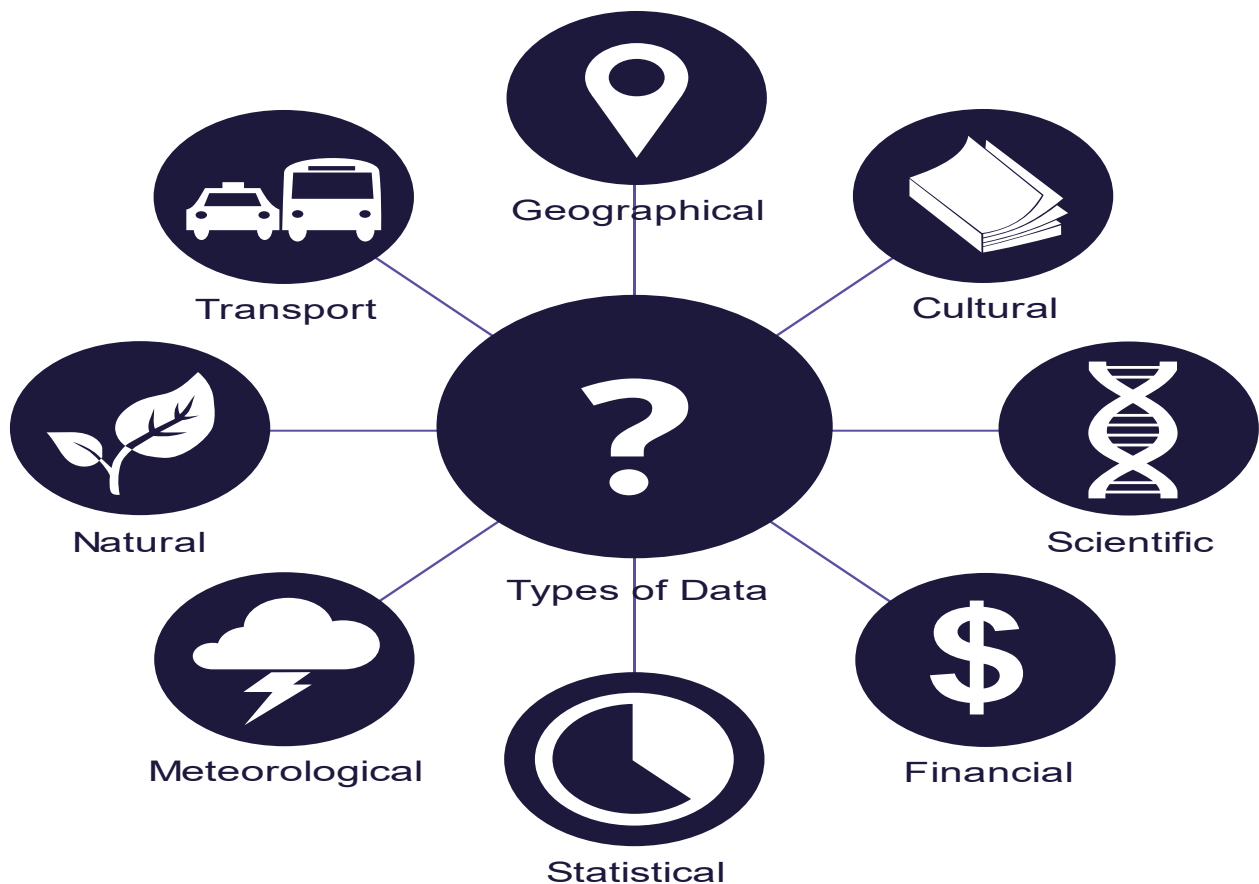
5 - Real time data

One of the most explosive trends in analytics is the ability to stream and act around real time data. Some people argue that the term itself is something of a misnomer i.e. data can only travel as fast as the speed of communications, which isn't faster than time itself... so, logically, even real time data is slightly behind the actual passage of time in the real world. However, we can still use the term to refer to instantaneous computing that happens about as fast as a human can perceive.

6- Genomics data

Bharath Gowda, vice president for product marketing at Databricks points at genomics data as another area that needs specialist understanding. Genomics data involves analyzing the DNA of patients to identify new drugs and improve care with personalized treatments.

DATA Types



Information:

Information can be thought of as the resolution of uncertainty; it is that which answers the question of "what an entity is" and thus defines both its essence and nature of its characteristics. The concept of *information* has different meanings in different contexts.^[1] Thus the concept becomes related to notions of constraint, communication, control, data, form, education, knowledge, meaning, understanding, mental stimuli, pattern, perception, representation, and entropy.\

Explanation

Information is associated with data, as data represents values attributed to parameters, and information is data in context and with meaning attached. Information also relates to knowledge, as knowledge signifies understanding of an abstract or concrete concept.[2]

In terms of communication, information is expressed either as the content of a message or through direct or indirect observation. That which is perceived can be construed as a message in its own right, and in that sense, information is always conveyed as the content of a message.

Information can be encoded into various forms for transmission and interpretation (for example, information may be encoded into a sequence of signs, or transmitted via a signal). It can also be encrypted for safe storage and communication.

The uncertainty of an event is measured by its probability of occurrence and is inversely proportional to that. The more uncertain an event, the more information is required to resolve uncertainty of that event. The bit is a typical unit of information, but other units such as the Nat may be used. For example, the information encoded in one "fair" coin flip is $\log_2(2/1) = 1$ bit, and in two fair coin flips is $\log_2(4/1) = 2$ bits.

Types of Information

Buck (1983) provides a useful classification of types of information that can be displayed to users.

1. Instructions

2. Command

3. Advisory

4. Answers

5. Historical

6. Predictive.

Each of these types of information can, in theory, be provided on most types of displays. However, some lend themselves better to one form of display rather than another. The characteristics of each of these types can now be briefly discussed. The particular forms of technology that can be used to implement them will be discussed in more detail in a later section.

1. Instructions refer to information that guides behavior in a particular way. In other words, it supports performance to carry out a task by prompting on what to do and when to do it. A simple sign telling people to enter or not enter a door would be one example. Other simple cases include the dialogue messages that are provided on automated cash machines (ACM). More complex instructions will appear in printed form on the packaging or the instructional manuals for pieces of equipment.

2. Command messages give a very straightforward statement on what is or what is not permitted. 'Do not enter', 'do not smoke', 'do not eat or drink', are examples of command messages. Sometimes they are similar to instructions, but are much more focused on simple statements that refer to high priority items.

3. Advisory messages are somewhat watered-down versions of command messages. In some cases, these will be recommendations to avoid a situation, at other times they would be information allowing for the preparation or planning of particular activities. For example, we might be advised that our train is late by a spoken message and we might, possibly, be given an accurate time estimate for when the train will be available.

4. Answers information may be provided in response to a particular enquiry that has been made. This is typical of an interactive information-handling situation, where we have a particular question in mind or degree of uncertainty and we seek information from a source with regard to removing that uncertainty. It turns out that most of the information that is sought from displays is of the answer kind. If we want to know what the time of day is, we look at our watches and clocks to find the answer. If we want to know what speed we are doing in our cars, or what level of fuel we have, we look at the gauges.

5. Historical displays are used to look back at the state of a variable over a period of minutes, hours, days or even years. A graphical representation of road accidents over the last century would be a historical display of information. If we want to know what the temperature fluctuation has been in an office on a daily basis, then specialist devices can be brought in and placed in the office that will give a pen recording over a fixed period of time. It is much easier to see if there is a trend in information if it is displayed in this way; the alternative is to hold in memory a general impression of what the temperature readings have been at a number of points during the day or record them manually on a chart. Gauging the temperature in an office concerns a relatively low risk situation. However, if the concern is with the temperature in a critical vessel in a chemical process, then the temperature trends exhibited over the time are quite important. If the current value is near a safety value, it may well be that it has been near that value for several weeks and is not a critical event. On the other hand, it may have reached that value in

the last few hours; looking back at the trend in the information will indicate the rate of change of that variable and whether it constitutes a particular risk to the system.

6. Predictive displays are much more specialized, but increasingly found in complex processes. In the same way that historical data support performance in making a judgment based on the current value, predictive information enables examination of the current value and indicates any likely change in the future. Predictor displays enable better control over vehicles, typically at sea or airborne, and enable smoother transitions from one state to another. They are used in slow response systems where it is difficult to see the immediate effect of an action that has been carried out. Predictive displays will enable a variable to be plotted into the future. The same graphs that are used as historical displays can also be used as predictive displays. If a steady decline in road accidents over time is seen, then the best prediction of the future would be a continued decline. However, it may be that this does not turn out to be the case because of some other factor that can enter into the situation. A predictive value is based on the best evidence available. But in the case of control of dynamic situations, such displays have much to offer in extending the human skill.

Data vs. Information - Differences in Meaning

"The numbers have no way of speaking for themselves. We speak for them. We imbue them with meaning." —Statistician Nate Silver in the book *The Signal and the Noise*

Data are simply facts or figures — *bits* of information, but not information itself. When data are processed, interpreted, organized, structured or presented so as to make them meaningful or useful, they are called **information**. Information provides context for data.

For example, a list of dates — data — is meaningless without the information that makes the dates relevant (dates of holiday).

"Data" and "information" are intricately tied together, whether one is recognizing them as two separate words or using them interchangeably, as is common today. Whether they are used interchangeably depends somewhat on the usage of "data" — its context and grammar.

Examples of Data and Information

- The history of temperature readings all over the world for the past 100 years is data. If this data is organized and analyzed to find that global temperature is rising, then that is information.
- The number of visitors to a website by country is an example of data. Finding out that traffic from the U.S. is increasing while that from Australia is decreasing is meaningful information.

- Often data is required to back up a claim or conclusion (information) derived or deduced from it. For example, before a drug is approved by the FDA, the manufacturer must conduct clinical trials and present a lot of data to demonstrate that the drug is safe

Difference between Data and Information

Data

Descriptions Qualitative Or Quantitative Variables which helps to develop ideas or conclusions.

Etymology Data comes from a Latin word, datum, which means "To give something." Over a time "data" has become the plural of data.

Format Data is in the form of numbers, letters, or a set of characters

Represented in: It can be structured, tabular data, graph, data tree, etc.

Meaning: Data does not have any specific purpose.

Feature: Data is a single unit and is raw. It alone doesn't have any meaning.

Dependence: It never depends on Information.

Measuring unit: Measured in bits and bytes.

Information

Descriptions: It is. a group of data which carries news and meaning

Etymology: Information word has old French and middle English origins. It has referred to the "act of informing.". It is mostly used for education or other known communication.

Format: Ideas and inferences.

Represented in: Language, ideas, and thoughts based on the given data.

Meaning: It carries meaning that has been assigned by interpreting data.

Feature: Information is the product and group of data which jointly carry a logical meaning.

Dependence: It depended on Data.

Measuring unit: Measured in meaningful units like time, quantity, etc.

Information

