Project Management and Technology

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INFM 205 Informatics Project Management

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December 6, 2021

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Project management and technology are always intertwined. In the field of informatics, project management requires the use and understanding of information systems and information technology. Informatics is focused on data and information and is therefore extremely intertwined with digital technology. Identifying and focusing on project types can facilitate individual projects to be successful by leveraging experience and a specialized depth of knowledge.

Types of Projects

Each project is unique by definition, but there are different types of projects that can be identified. Project management frameworks are the same for many projects, but need to be tailored to the unique project taken on. It would be helpful to categorize projects at a higher level. For example, there are IT projects and traditional construction projects. Project management textbooks invoke "the Great Wall of China, the pyramids, or Stonehenge" to show the impressive results of project management (Watts, 2014, pg. 8). Each project is unique, but some projects are similar. NASA projects are almost always unique, but they provide high-level categories of projects including space flight projects, information technology projects, research and technology projects, and software projects (Shea, 2017, pp. 17-18). Each of these types of projects have to follow different requirements. Even though NASA is thought of as all space flight and technology, they even differentiate between different types of projects.

At a high level all projects are unique, but can be put into generalized buckets. One interesting concept is the difference, or lack thereof, between technology projects and business projects. Traditional business project managers have the general expertise of undertaking, business value, and completion of projects, while technological project managers have crucial

understanding of the technical landscape and obstacles (Jordan, 2012). Project managers

definitely need to have the soft skills and general project management experience. Technology is

everywhere, and a knowledge of technology opportunities and obstacles is important. This is

extremely important in the informatics field that deals with data and information. The need for a

solution should be what initiates a project, not the desire for the newest technology. In terms of

business-focused and technology-focused experts, an ideal project manager should "facilitate the

conversation between the two . . . provide an execution framework and . . . remain within the

realm of what is realistic given the project constraints" (Jordan, 2014, The reality sec., para. 3).

A book called *The IT Project Management Answer Book* boldly claims that, "[t]he truth

is that there is no such thing as an IT project" (Pratt, 2012, Chapter 1, Types of IT Projects

section, para. 1). There can be no doubt that IT projects do exist, and that they are completely

different from a freeway construction project (though a freeway construction project might very

well have IT sensors, like lights or toll cameras). It is just that IT projects cannot be justified

without business value. Pratt (cited above) explains:

> IT projects are all around us. They abound in today's business world, where
>
> automated work processes and decision-support systems dominate the landscape.
>
> And while all this is true, it is equally true that the business need drives the
>
> demand for IT resources and not the other way around (2012, Chapter 1, Types of
>
> IT Projects section, para. 2).

It is a nuanced definition, but makes sense. An IT project needs to have a business purpose in

order to be justified. In general terms any project needs to solve a problem or take advantage of

an opportunity to be worthy of taking on.

While all projects are unique, IT projects can be differentiated from other types of projects. Even then, IT projects can be differentiated and categorized as in the NASA example above. There are no universal frameworks for how to differentiate IT projects. Having an understanding of different sorts of IT projects will help inform scope formulation and management as well as identifying risks. It would be beneficial to look at how others classify IT projects.

Types of IT Projects

Since there is no consensus framework of types of IT projects, an exploration of different frameworks will be explored here. Pratt identifies 5 high level IT project:

1. Custom software development project: the project team intends to write the software to meet an organization's needs from scratch.

2. Commercial off-the-shelf (COTS) package implementation project: the project team selects a predeveloped software package for support of an organization's business needs.

3. Software package integration projects: projects take existing pieces of software and bring them together to support an organization's unique business needs.

4. Infrastructure project: implement or upgrade the capabilities of an organization to support the organization's technical systems. (ie., the replacement of hardware or the installation of new network switches or communication lines).

5. Transfer system project: systems that have been developed by one organization and are available for implementation for another organization

with similar business needs. (2012, Chapter 1, Types of IT Projects

section).

The value of having these types of classifications helps to understand the challenges and nature

of the IT project. It can and should get even more granular.

NASA has a specific framework for space flight projects, different from all other projects

they undertake. Obviously NASA has been to space a lot, and they have failed a few times.

NASA has categories that are still high level, but are granular compared to the space flight

projects classification. They include two very similar projects but with different stakes: human

life or not. They call them "human space flight projects" and "robotic mission projects" (Shea,

2017, pg. 18). Even those are all going to be unique: International Space Station, Mars, Hubble,

Moon. So many options. Knowing whether a project involves human life or not is an important

distinction. It is also valuable to know if an informatics initiative is a project management or a

type of service. It is important not to conflate the two, though project management and services

can come to each other's aid. Two interesting issues are data governance and cybersecurity.

Data Governance

Data governance is an important aspect in informatics. It is useful to know if a data

governance initiative is a project or an ongoing service. In general, data governance is an

ongoing management service. It is important to note and communicate that data governance is

not a project. Data governance implementation might be a project, maybe some IT project

creates or refines a data governance decision support system or dashboard.

It is important as project manager, data governance officer, or tech employee to recognize

that date governance itself is outside the scope of projects. Projects are under time and budget

constraints, so it should be recognized because "businesses fall into the trap of making data

governance the responsibility of their app developers" (Boersma, n.d.). That does not mean that projects cannot support data governance. It just means that if a project is a data governance implementation, that should be clearly communicated. Data governance is unique in that there is a finite project aspect to implementation, but the scope should be kept to a minimum in terms of the project of implementing the program.

If an IT project has any sort of data governance in it, it might be worth separating that aspect and keeping it out of the scope of a software project for example. Implementing data governance can be a project, but the actual ongoing operation or service of data governance must be outside the scope of any project. This is an example of a risk being both positive and negative. The negative is conflating data governance with project management. The positive is that independent projects can be identified, providing a project management firm or department with steady work.

A firm could possibly focus only on data governance implementation projects while not providing the ongoing service. One piece of advice states, "[d]ata governance is a big topic, and implementing it is a challenging undertaking. As with many big projects, you'll learn a lot from your first implementation. You'll learn even more from your second one" (Boersma, n.d.). Data governance implementation is a project, ongoing data governance itself is most decidedly not.

Issues like knowing regulatory compliance needs to be the job of the data governance office, not the project management group. A project could be informed by regulatory compliance in the requirements, but is outside the general scope of most IT projects. "Compliance is about following laws and rules to prevent wrong things from happening as well as detecting and mitigating incorrect actions of the past"(Mahanti, 2021, Chapter 5.1, para. 1).

Cybersecurity

Cybersecurity is important in terms of informatics because of the data also related to data governance and compliance issues. It is important that any cybersecurity project is recognized as finite and not conflated with ongoing operations. There are many cybersecurity positions as part of ongoing operations. It is important for project managers to recognize if a cybersecurity initiative is a project or ongoing service.

Pentesting is a finite project with a scope. Building or implementing software is easily identified as a project. It is possible to see pentesting as an operation, but it needs planning. "Rarely, though, are the words 'project management' and 'penetration testing' brought together. Conducting a penetration test without any planning is tantamount to disaster" (Pentest Project Management, 2013, Chapter 5, Project Management section).

Pentesters, breach and incident investigators, cybersecurity engineers and architects all need to have project management skills (Frank, 2019). This is because many ongoing operations have projects within. It is important to recognize projects so that you can then use project management frameworks to bring in stakeholders, formulate scopes, and identify risks.

Being able to identify separate cybersecurity projects is important. It is also important to understand cybersecurity risks in a project. Threats to consider are breaches, leaks, malware, sabotage, and sprawl (Mitchell, 2019). Sprawl is interesting because it involves a complex system that can be exploited. While each individual project is separate, it is worth looking at the big picture to identify not only threats but opportunities for cybersecurity projects to shore up systems.

Ways to Classify a Project

We are interested in project management and its relationship to informatics, therefore IT project management. Notwithstanding, project management is very high level and does not need to be constrained to IT projects. Also, it is important to classify and, perhaps, pass off a project to a more competent project manager for the situation.

It is difficult to find ways people categorize projects. One article suggests classifying projects according to complexity, source of capital, project content (IT or construction), those involved (internal or external), and/or objective (Sinnaps, n.d., Classification of Projects section). But because there is no standardized way to label projects, companies must come up with their own taxonomies. "Organizations were found to have multiple project classification systems in use, some formally recognized and others informally applied" (Crawford et. al., 2002). It is ideal to know what sorts of projects you are working on. Using past experiences can help set up new projects, while tailoring to set up the uniqueness of the project at hand.

Project Portfolio Management

An important concept in project management is project portfolio management (PfM). It is important to note that PfM is not project management. Project management is about doing projects correctly and PfM is about selecting the right projects (Oltmann, 2008). "Project portfolio management is concerned with managing groups of projects, programs, and operational activities . . . that compete for scarce resources and that are conducted to achieve strategic business objectives" (Enoch, 2015).

PfM is a big picture view of projects. The value, promoted here, is in identifying types or classes of projects. Why? Well this can be viewed as a problem and solution statement:

- Problem: You are rebuilding your workflow at the beginning of every project.

- Solution: Templatize and simplify your project planning process (Martins, 2021).

Using PfM can help to jumpstart projects by using past experience as a guide. There is no reason to restart a project from scratch because frameworks from past projects can be created to then tailor to the unique project. A few benefits of PfM are presented by Saviom: "informed decision making . . . minimize risk, maximize business value . . . deliver projects within time and budget . . . increased ROI . . . creating assets and sharing best practices" (Deshmukh & Mohan, 2021). PfM can be used within a corporation or even by a dedicated project management firm to pursue and accept appropriate projects..

Conclusion

There are many project management systems. There is no universally recognized taxonomy or category system to file certain projects. It can't be denied that a construction project is different from an IT project. While project management is high level, there will always be those who are more competent in one type of project over another. And there are all sorts of different frameworks from PMBOK to Agile. Using project portfolio management can help initiate projects, understand the scope quickly, understand risks and how to mitigate or take advantage of them, and really to give extra value to the closing.

IT projects vary widely. Informatics is focused on data and usability. The 4th Industrial Revolution is basically IT and data. A project manager focused on IT will not and should not bother learning how to manage building pads and buttresses for large buildings. Specialization is

necessary, and ,with that, frameworks for the fast paced IT world. Data is extremely important now and specializing in projects in IT is valuable to leverage data. According to Herbert (2020):

> The technology of the Fourth Industrial Revolution is inseparably tied to the vast amounts of data needed to train artificial intelligence and other key forms of modern technology. The need for data has led to exponential growth in gathering it.

There are many types of IT projects. As explored above there are data governance and cybersecurity projects. There are many other types of projects like artificial intelligence, internet of things, simple websites, e-commerce, etc. Frameworks and types of projects need to be identified in order to facilitate project management. Like the example of NASA and spaceflight having different categories of flight depending on if humans are on flight or not, data governance projects and cybersecurity projects will have different nuanced considerations. Issues like compliance, security, value, and ownership of data. Data and information as valuable is here to stay, it is necessary to know if an action is an ongoing operation or a unique project in service and pursuit of the bounties of the 4th Industrial Revolution.

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