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Contrasting Construction and Business Projects: Implications for Project Management Techniques

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Abstract

From textbooks and education on project management, practitioners may be forgiven for assuming that well-documented project management techniques apply universally. In questioning the assumption, this paper shows that the nature of the project needs to be considered when deciding on techniques and, more importantly, how to apply them.

While acknowledging the broad spectrum of projects, the approach taken is to contrast the extremes. On the one side is a typical construction project with a detailed specification being executed by a contractor; on the other, is a typical business project where, even if the overall objective is agreed, the way of achieving it is still to be determined and will change as the project unfolds. Contrasting different kinds of projects has not been found in extant literature, hence there are few references. To explore this new area, the following are covered. Four project examples are given to illustrate the differences between construction and business projects. The differences are then analysed on eight dimensions, Using this as background, eleven aspects of project management and some of their techniques, are discussed in terms of how they are applied.

Most of the paper is based on the author's experience as a practitioner overlapped with teaching of project management and project governance. Because research has not yet been done, eight areas for possible future research are suggested.

Keywords: Business project, Construction project, Project management techniques, Project management research areas.

1. Introduction and Purpose

Very little of this paper is based on hard research. Most of it comes from the author's many years of experience covering mainly business and IT projects, but also some construction. Its purpose is to contrast different kinds of project and show how approaches and techniques need to be adapted according to the nature of the project. So, although not academic,

the paper is intended to provoke thought, build the reader's perspective, and put forward new avenues for research.

To achieve this, the paper: (i) gives illustrative examples of construction and business projects, (ii) clarifies some of their fundamental differences, (iii) shows how the stages during their lifetimes differ, and (iv) discusses several important techniques that, depending on the project, need major adaptation or do not apply. Before concluding, the paper suggests some areas where research would provide valuable insights. However the suggestions are not comprehensive, so concepts put forward along the way may also serve as a trigger for formal research.

2. Projects, Project Management Teaching, and the Role of Governance

A change of any magnitude in an organisation requires a project. Such projects might be done informally, but increasingly organisations are managing their projects with more structure. Whether the change is a small work request or a large initiative taking months or even years, most organisations justify, prioritise, manage, and review the outcomes more formally. Any change in how an organisation does things, or in the products that it offers, is a business project. Such projects differ greatly from a pure construction project where something is built according to an approved design. Project management techniques apply to both, but how they are applied differs. Textbooks and courses tend to cover the theory and basic techniques in the context of construction-type projects which are easier to grasp. They seldom explain which techniques need adaptation for business projects or whether the techniques are needed at all. In courses, building a house is sometimes used as an example, making project management look easy. However, the difficult and messy negotiation needed before construction starts is seldom mentioned.

This paper contrasts a typical construction project with a typical business project. Then, referring to the differences, it indicates how some of the techniques are affected. It is accepted that the spectrum of projects is vast and that many projects have business and construction aspects. Thus, sound judgement is always needed in project management and project governance. Having mentioned governance, it is worth explaining how it relates to project management. Governance is what happens around the projects in an organisation to ensure that projects meet the organisation's objectives within the constraints of the available people and money resources. Governance includes the selection, prioritisation, tracking, and evaluation of outcomes, as well as the decisions that go with them. Governance also applies to each project; it is here that the project sponsor, the accountable executive, to whom the success or failure of the project means a great deal, plays a key role. Besides supporting the project manager who does the day-to-day running of the project, the sponsor should periodically review whether a business project is being handled properly and remains justified, or whether changes are needed.

3. Illustrative examples: a construction project and three business projects

The differences between projects are best illustrated by giving four hypothetical projects as examples. The first is a typical construction project. The remaining three are business projects.

Project 1. Construction of a bridge

The bridge will take cross-flowing road traffic over a much-used highway. Considerable investigation was done by the government organisation responsible for roads in the area. Traffic patterns were measured and estimates were made of future traffic flows. It was necessary to engage with nearby communities who would use the bridge or be affected by it. Once specified by competent engineers, and after a tendering process, the tender was awarded to a construction company and a contract was drawn up. The contractor, in responding to the tender had detailed and estimated the main work to be done and also produced a high-level schedule for the work, based on experience from building similar bridges. Upon signature of the contract, work began according to the specifications. The project manager recognised the likelihood of minor changes from the customer, but did not expect anything to change the fundamental structure. As work progresses, some done by subcontractors, the project manager is carefully monitoring the critical path in the schedule and also the costs of each major component of the construction. The aim is to optimise profitability by ensuring that the costs come in as planned (well below the agreed fixed price) while meeting the specifications and agreed delivery date.

Project 2. Development of a strategic new product

The company wishes to expand its range of kitchenware by developing a new cooking pot that can be remotely controlled from a smartphone ‘app’. This is in line with their strategy of harnessing 4th Industrial Revolution technologies to boost their innovative image. The project objective is to develop the product, launch it nationwide with marketing support, and have the production facility set up to support initial sales volumes. It is to be an internal project, managed by an experienced project manager who will arrange for certain elements to be outsourced, such as the development of the smartphone app and the supply of standard components. There is a four-page business case, but the project manager is aware that some of its assumptions will need careful checking. Moreover, the product design still needs to be finalised, and it is already clear that Marketing is not unanimous on some of the features. Possibly a customer survey will give useful input.

Project 3. Enhancing municipal records management to comply with legislation

Municipal management has initiated a project to bring their processes into line with recent legislation to protect the 500 000 people and organisations in their municipality in terms of personal information held. The data, some of which is sensitive, is mainly stored on a central system. However, some data is also kept on other systems. The project sponsor is one of the top municipal executives and a project manager has been appointed. Planning is in the early stages. Defining the scope is not proving to be easy. While the legislation is broadly understood, periodic clarifications are published that affect its implementation. There is acceptance that the Information Technology department must support the initiative, but the extent of their involvement is not yet understood. In addition, the project manager realises that much of the change needed involves the 2 000 municipal employees, many of whom use and update the information. A business analyst is already on board and is busy recording and prioritising the processes that will need to be enhanced.

Project 4. Merging of two departments following the acquisition of another company

It was decided that having two departments doing similar work is not ideal. Hence, a project was launched to merge them. The goal is therefore clear – there must be one department. However, little has been decided regarding the details, which would need to be investigated and dealt with as part of the project. For example: Where will the department be located? How will it be managed? What are the staffing requirements and will some people be redeployed? Are the cultures compatible and are there resentments among certain staff? What systems will be used? How will systems be reintegrated and will any data need to be converted? What change management activities will be needed to reorient staff to new processes? It may not even be clear who will play the sponsor role.

The first project outlined, the bridge, illustrates the characteristics of a construction project. The scope and resources needed are well understood and can be estimated. The work can be tracked using a schedule, and accounting staff can monitor the costs. Most risks would be known and covered by a contingency amount built into the price. Any changes to the contract will be negotiated between the contracting organisation and the government entity, with plans updated accordingly.

The other three projects are business projects. Their objectives are clear. However, neither the requirements nor the deliverables are fully understood. The activities to produce the deliverables are not yet known and will be difficult to estimate because they will change as the project unfolds. Nevertheless, for each project, it is possible to identify some of the risks and to respond to them. Initially, reporting to management would be somewhat subjective and require judgement. Reporting would likely improve as the scope unfolds.

This section has been illustrative. The next section will be more specific as to the differences between a typical construction project and a typical business project. As mentioned above, there is a spectrum of possible projects, and indeed, the pre-project work to design and get approval for the bridge in the first example has many aspects of a business project.

4. What is a business project? Comparisons with a typical construction project

The best way to understand business projects is to contrast them with typical construction projects which have been awarded to contractors. There are many aspects:

1. Requirements: For construction the objective is clear and specifications are available. The main tasks are known and are likely to have been estimated by a specialist. For business, the objective is broadly understood, but the detailed requirements and the activities (tasks) to achieve them, may not be, making estimating difficult.
2. Change: Once the design for the construction is approved, there is relatively little change. The requirements for business projects change regularly. Even the priority may change as other projects arise. ‘Rolling-wave’ planning is common whereby activities are only planned in detail close to the time that they are done (PMI, 2021).
3. Size: Construction projects are generally larger in monetary terms. Therefore, it is affordable and indeed necessary to

have people assigned to do scheduling and cost tracking. On-time, within-budget is important to avoid eroded profit and possibly penalties. Business projects are smaller but more numerous, and the project manager does most of the schedule and cost tracking. Nevertheless, business projects may be complex, critical for the organisation, and carry high risk. Business satisfaction with the results is a key measure of success.

4. Benefits: Construction benefits usually come directly from the deliverable. One can drive over a bridge as soon as it is built. Business project benefits may take time to realise and need involvement from many people (Musawir et al., 2017). Some will change the way that they work requiring support and focused activities (referred to as organisational change management). The project manager may have moved on, leaving benefits realisation to business people.
5. Progress: For construction, progress is visible and can be inspected by people wearing hard-hats. For business (especially IT) progress can be hard to see and evaluate. Team members might say that progress is ‘fine’ when it is not, and unexpected events can trigger the need for replanning or rework.
6. Location and resources: Most construction tasks happen in one location with dedicated people. It may be difficult to accommodate the people and equipment close to the site. Business projects are often geographically spread, with many part-time team members. Here the challenge may be to anticipate when people with the right skills are needed and then to negotiate their availability (matrix management).
7. Skills: Construction skills, while important, are fairly interchangeable. For business projects, key people may have unique skills that apply to a product or to their organisation. To replace them would require a lengthy learning curve.
8. Management: The construction site project manager, or supervisor, needs to be in charge and must have authority. Business project managers usually lead by persuasion, expertise, influence, removing obstacles, and understanding of the prevailing politics.

Project management principles and their underlying theory are well established. What is less well understood is how they need to be adapted for a specific project. Documented project techniques simply do not work for some business projects – or need significant adaptation. Indeed, there is a spectrum with some business projects having construction elements. Also, construction, engineering, and mining organisations run many business projects. Figure 1, while not comprehensive, summarises some of the characteristics that distinguish construction and business projects, while indicating the spectrum.

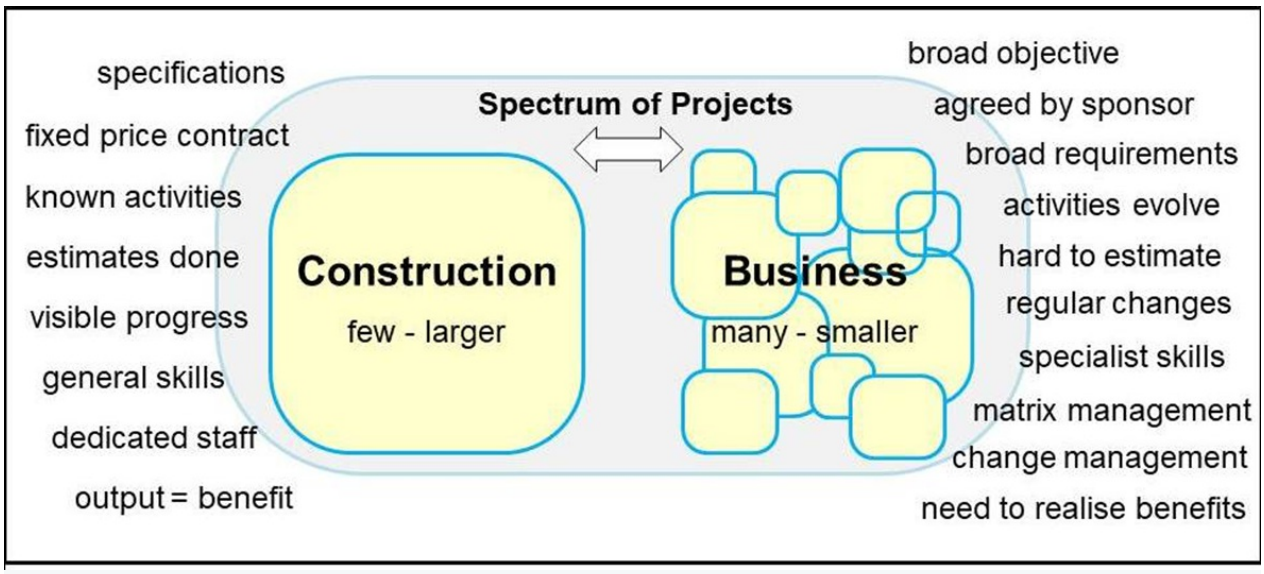

Figure 1. Contrasting Construction and Business Projects

5. An explanation of some differences in the project stages

Besides the differences covered in the previous section, construction and business projects typically have different 'lifetimes'. The lifetime of a project starts when it is first proposed and ends when the benefits are, or continue to be, realised. The life cycle of a project is shorter. It starts when the project is authorised to begin and ends at project closeout. How these apply for construction and business projects is illustrated in Figure 2.

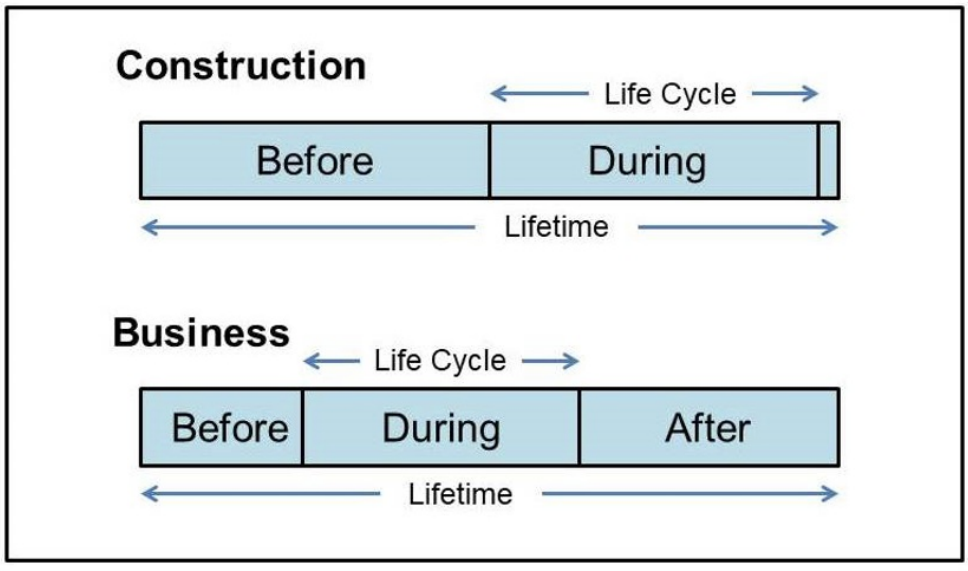

Figure 2. Construction and business – typical project stages

Three stages of the lifetime are considered:

- The pre-project stage happens before the project starts and might cover a proposal, a business case, project selection, and the negotiations that go with them.
- The during-project stage is the project itself. It covers all the life cycle process groups of initiation, planning, executing, closing, and monitoring and controlling (PMI, 2017).
- The post-project stage happens after project closeout and mainly focuses on benefits realisation. It would usually involve ongoing change management – helping people to take advantage of the project deliverables.

For a typical construction project, a great deal of work is needed before the project starts. The requirements are debated, stakeholders are consulted, designs and even models are produced, specifications are checked, and tenders are issued. Estimation of likely time and costs might be done by the owning (buying) organisation before issuing a tender. Estimates would be repeated independently by those bidding for the contract. When the contract has been awarded, the project can start, and this is the part that is well covered in courses and textbooks. When the construction has been delivered, there is relatively little to do after the project. Even for engineering construction, commissioning (including testing) might be done as part of the project life cycle.

For a typical business project, there is work to be done before the project starts. A justification is needed, whether informal or documented as a business case. The project might be prioritised taking resource availability into account, and a person appointed to manage or coordinate the project. After project closeout benefits seldom happen automatically. Work is needed, mainly by business stakeholders, to enable people to use the project deliverables for the benefit of the organisation (change management). Often, adjustments to the deliverables are made as the need arises. This post-project stage is seldom ended formally and even if a post-implementation review were to be done months after closeout, reinforcement of the new processes by management might still be required.

6. Practices that may need to be adapted

Now that differences between business and construction-type projects have been noted, it is possible to assess how some of the techniques need to be applied for each.

1. Managing the project's justification (business case).
   For construction, the justification is confirmed, based on a fixed price bid, before the project starts. Only exceptional circumstances would cause it to be stopped or changed. For a business project, the justification, often documented in a business case, should be reviewed regularly (Einhorn et al., 2019). Assumptions made may turn out to be incorrect, and new information, from inside or outside the organisation, could result in major changes or even the project being terminated. The latter outcome should not necessarily be seen as a failure, but possibly as effective governance.
2. Project estimation of schedule and cost
   For a construction project, estimation is done, usually by experts, based on the specifications. A business project might have a 'top-down' estimate done before the project-start, based on similar past projects. A revised estimate, 'bottom-up' this time, could be done towards the end of planning. However, where 'rolling wave' planning is done, there would

still be uncertainties. All of the approaches mentioned call for expert judgement (PMI, 2021).

3. Producing a PDD (project definition document)

   While a PDD might be unnecessary for a well-specified construction project, it is of great value for a business project and is usually done by the project manager (Einhorn, 2022). It would outline the business goals, project objectives (high-level deliverables), scope activities to produce the deliverables, the benefits and costs, the stakeholders including the people who will do the work, the milestones (with dates), the risks, and any assumptions, dependencies, constraints, or outstanding issues. Even for a medium-sized project a PDD might only take a few weeks and be less than ten pages. It ensures that the project manager has a sound understanding and that the sponsor and other key stakeholders have aligned expectations.

4. Gathering detailed requirements and defining the deliverables to meet them.

   The construction specifications are needed before the tendering process and the awarding of a contract. For a business project, agreeing on the *detailed* requirements is usually done after the project starts and may be an iterative process. The outcome is likely to affect all subsequent processes including scheduling.

5. Determining the activities required to produce the deliverables.

   Often this is done in the form of a WBS (work breakdown structure) (PMI, 2021). For construction, this should have been done as part of the contractor's bidding process. For a business project, detail can only be produced when the requirements are agreed upon. If cost estimates were done before the project, they would need to be revised based on requirements agreed later, which might, in turn, affect the business case.

6. Project scheduling

   The construction schedule can usually be produced midway through planning, often indicating a ‘critical path’ (PMI, 2017). Resource-levelling might be used to prevent overloading. For a business project, a schedule is only possible later, when the requirements and activities are better understood. Even then, activities will change regularly, making it difficult to identify a critical path.

   It is noted that, for any project where there are few dependencies between activities, allowing most activities to be done in any sequence, there may not be a critical path. For Agile projects, the scope is selected from the work backlog at the start of each sprint which may last between two and six weeks (Gemino et al., 2020). Even then, moving activities (from planned, to in-progress, to complete) on an electronic ‘Kanban’ board is usually preferred to a schedule.

7. Change control

   This is relevant to all projects. However, changes to deliverables are easier to detect and manage on a construction project. On a business project, well-justified changes, originating from business people, arise periodically, but are manageable. More difficult are the small changes that can be frequent and hard to detect. Vigilance by the project manager and cooperation from the team is needed to avoid 'scope creep’ through unauthorised changes (Einhorn, 2022).

8. Progress evaluation and estimation of percentage completion

   It is here that different techniques are most needed. EVM (Earned Value Management) is the accepted standard for tracking progress from both a schedule and cost point of view (Brandon, 1998; PMI, 2017). To carry it out there are

several requirements:

- The scope activities must be known up-front.
- Activities must be scheduled with a start and end date for each activity.
- It must be possible to estimate the planned cost of each activity, and later measure the actual cost when it is completed.

These requirements are generally met for a construction project. Even then, only a small percentage of construction projects use EVM (Olawale & Sun, 2015). However, it is likely that most of the remainder do something similar. As explained earlier, the above requirements are seldom met for a business project making EVM (as explained in textbooks) almost impossible (Einhorn, 2016). Fortunately, for business projects, there are simple and highly effective techniques (which use similar principles to EVM) for estimating progress (Einhorn, 2022). The author may be contacted for more information.

What has just been explained is not generally understood. Consultants who measure project management maturity, often have EVM as one of the criteria for achieving the higher maturity levels. Accordingly, those being assessed might insist that EVM is their standard and even claim that their project managers are using EVM for business projects.

9. Cost tracking and the assessment of cost variances

   For construction, fixed-price contracts are the norm. Tight cost control allows the contractor to optimise profit by keeping costs to a minimum while meeting the scope, quality, and schedule requirements.

   Cost estimating is generally done at the work-package level, and summed upwards to summary-package levels. Actual costs are then assigned to selected summary-packages (control accounts), allowing cost variances to be calculated. Monitoring the variances, helps the project manager to identify where cost overruns are occurring and to take actions to limit them (PMI, 2017).

   For business projects, where activities unfold, the cost of activities cannot easily be estimated. Where cost will be monitored, a budget is often given at the project level based on affordability or on similar past projects. It would include some contingency for risk. Much of the cost relates to people's time. Monitoring such costs is usually also done at the project level because team members work across many activities, and separating the cost of their time is too onerous. The project manager might track costs against estimated percentage completion using the techniques mentioned above under ‘progress evaluation’. However, cost is seldom the criterion for success. Rather, stakeholder satisfaction with the outcomes is key. If there is substantial business value, the project manager and sponsor are likely to be forgiven for explainable cost overruns – after all, the budget may have been based on order-of-magnitude estimates in the first place. For Agile projects, the cost of each sprint can be estimated, and decisions are based on whether sprints are generating value in excess of the costs.

10. Organisational change management

    Change management is about people adapting to new processes and very little is required for a construction project. On the other hand, for a business project, how change management is handled can ‘make or break’ the value that the project delivers (Einhorn, 2022). Usually, change management activities would be part of the project; alternatively, they might be done in parallel with the project. Either way, there should be committed involvement from business people. If

people-change is neglected, it can lead to failure due to expected benefits not being realised. Not recognising the need is a common cause for underestimating the project's scope, and change management activities can consume considerable time and cost.

11. Agile mind-set.

    For the project manager, having an agile mindset means being willing to rapidly adapt to changing requirements. It is a personal characteristic rather than a technique. Some adaptability is needed in the construction environment, but it can be critically important for business projects. Even for business projects, judgement is needed. If the project manager is over-responsive, it can result in rash decisions being taken; if under-responsive, necessary changes may be unduly delayed. An open mind, and a sound relationship with the sponsor, are supportive of well-justified changes being appropriately handled.

    Much needs to be handled differently between construction and business projects. The above are just some of the more important ones. Figure 3 illustrates how techniques and approaches need to be adapted or discarded depending on the project at hand.

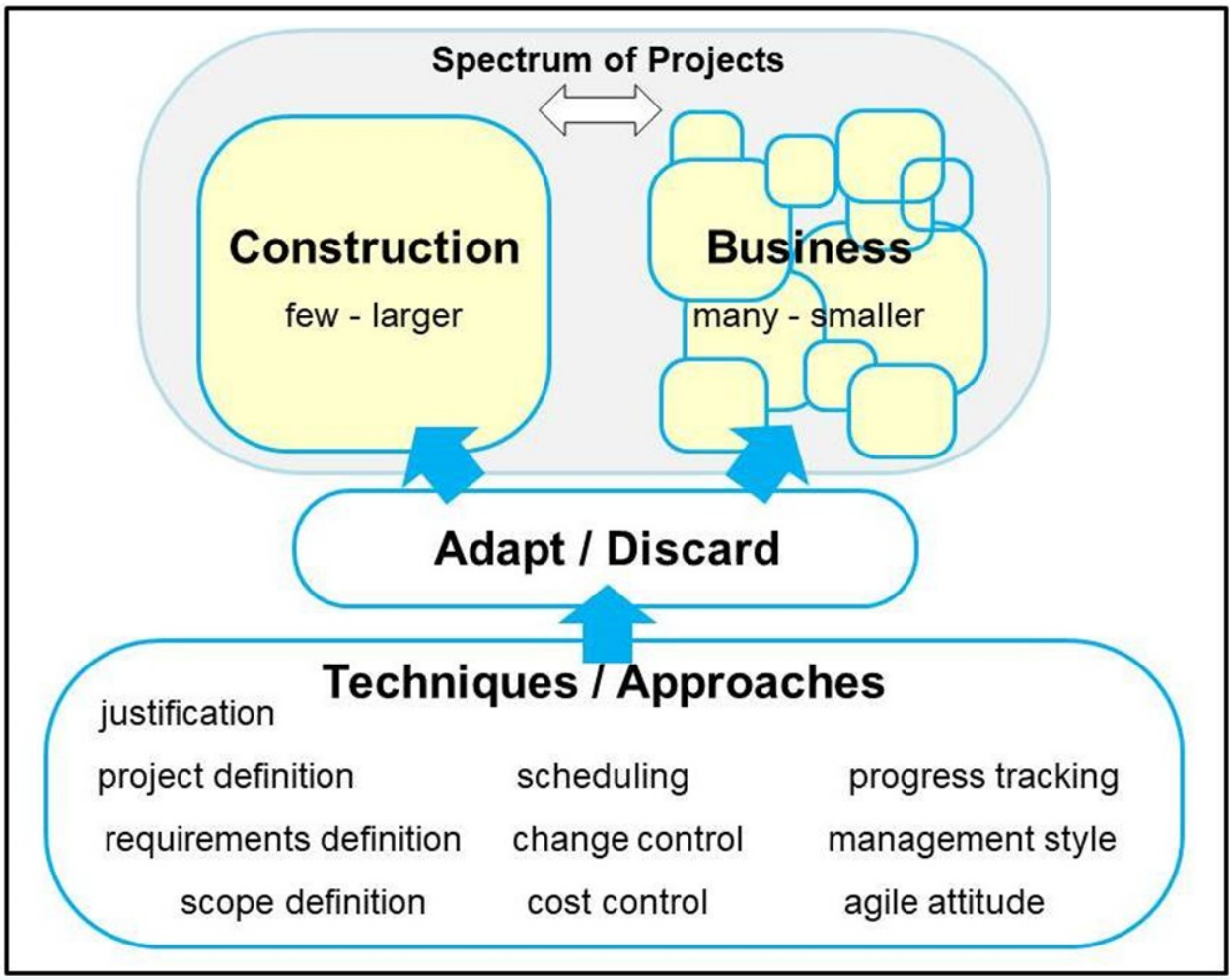

Figure 3. Applying Techniques and Approaches

7. Areas of possible research

Both qualitative and quantitative, or even mixed, methods could be used to research the practices in various project situations. It is noted that *actual* practices may differ markedly from what 'should' happen according to standards and textbooks. The following are some examples of research opportunities drawn from the above observations, but, undoubtedly, there are many more. For each area, a few possible research questions are suggested. For certain areas, it may be desirable to classify projects into different types (beyond only construction and business).

1. Management style: What characterises different styles of project management? What forms of power does each style use to achieve the project objectives? How do the styles in current use relate to different types of projects? What styles do informed stakeholders believe to be most effective?
2. Use of the business case: How does use of the business case vary across different types of projects? How should (and is) the business case used and updated, through to benefits being realised and assessed?
3. Project definition: What approaches are used to ensure that the sponsor, key stakeholders and the project manager have a common understanding of what the project will produce?
4. Stakeholders: How does stakeholder engagement vary across industries and types of projects? How are skilled resources applied in different project environments?
5. Scope activity definition: What processes are used to confirm the business requirements and the deliverables? How and when are project activities determined? How are changes to the activity plan handled?
6. Use of a project schedule: What planning activities are needed before a schedule can be agreed to? What tools are used to manage the schedule? How does the project manager monitor the critical path (if there is one)? How is the schedule used for reporting on progress?
7. Change control: How are changes to deliverables managed on projects? How are the project team involved? What is the decision-making process?
8. How is ongoing project performance assessed in different environments to determine whether the project is ‘on track’? What schedule and cost management techniques are in general use? How effective are they – does management trust the reports that they receive? Should different approaches be applied to different types of projects?

8. Conclusions

The purpose of the paper is to contrast different kinds of project and show how approaches and techniques need to be adapted according to the nature of the project. This has been met by showing that there are many differences between a typical construction project and a typical business project. These differences affect how project management disciplines are best applied, and the differences are explained in key areas of project management. However, it is recognised that a broad spectrum of projects exists, and that judgement is needed as to how techniques are applied in each situation. Because the actual project management practices, which may differ considerably from established standards, are so varied, there is scope for research. Accordingly, a few research areas have been put forward and suggestions made as to possible research questions.

Potential competing interests

A book, by the author, was published recently and is referenced in this article. The author is unaware of any other competing interests.

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