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Guiding Principles for Integrally Christian Engineering Work in Industry

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Abstract

What is integrally Christian engineering? Or to ask it slightly differently, what does engineering look like if it is faithful and obedient to God's will as revealed in His Word? I do not think we, as finite and creaturely Christ-followers, can expect to exhaustively determine God's biblical directive for every facet of engineering and technology on this side eternity. However, if we truly believe that Christ is Lord of all of life and that He calls us to grateful service in everything we do, we need to continue to wrestle with these questions. One framework to help navigate these questions that has been proposed and previously presented consists of five guiding principles for engineering. These principles were developed by focusing on God's Word as the Christ-narrative, the Creation-Fall-Redemption story, and applying this lens directly to engineering. The guiding principles have been applied in academic settings including both curriculum and scholarship, and in this paper they will be used to analyze and critique service in a few different engineering settings of the work-a-day world. Reflections on these principles from engineers in different industries including manufacturing, power distribution, building systems, and civil infrastructure will be collected and presented to shed light on how it makes a difference in the daily lives of engineers to view their work through a distinctively Christian lens. My prayer is that this work will help us continue to learn how to engineer in a way that gives all glory to God as we live in the already and not yet of Christ's kingdom.

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Comments

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What is integrally Christian engineering? Or to ask it slightly differently, what does engineering look like if it is faithful and obedient to God's will as revealed in His Word? I do not think we, as finite and creaturely Christ-followers, can expect to exhaustively determine God's biblical directive for every facet of engineering and technology on this side eternity. However, if we truly believe that Christ is Lord of all of life and that He calls us to grateful service in everything we do, we need to continue to wrestle with these questions. One framework to help navigate these questions that has been proposed and previously presented consists of five guiding principles for engineering. These principles were developed by focusing on God's Word as the Christ-narrative, the Creation-Fall-Redemption story, and applying this lens directly to engineering. The guiding principles have been applied in academic settings including both curriculum and scholarship, and in this paper they will be used to analyze and critique service in a few different engineering settings of the work-a-day world. Reflections on these principles from engineers in different industries including manufacturing, power distribution, building systems, and civil infrastructure will be collected and presented to shed light on how it makes a difference in the daily lives of engineers to view their work through a distinctively Christian lens. My prayer is that this work will help us continue to learn how to engineer in a way that gives all glory to God as we live in the already and not yet of Christ's kingdom.

Introduction

I have been in Christian higher education in engineering for almost 11 years. But 12 or 13 years ago, I never would have envisioned that the world of academia would be God's plan for me. During that time, I was in the middle of a stint that lasted over 5 years working as a structural engineer in a consulting company that specialized in work related to heavy industry (oil production, steel production, power production, etc.) I could have seen myself continuing in that line of work for 30 or 40 years. One of my main motivations in that work was the recognition that the work we did made a difference for society. My Christian world and life view helped me recognize that love of God and love of neighbor should be the primary motivators for my work, and it gave me joy each day to be able to reflect on these principles and seek to discern how to be faithful in this call. It probably comes as little surprise for me to reveal that my cubicle-dwelling neighbors at work had a hard time finding similar joy in their work, even when it was nearly identical to mine, when their main motivator was making money to live for the weekend.

God instilled this passion of how my worldview makes a difference in my daily work primarily during my time as a student in a Christian institution with an engineering program. In a surprising direction-changer for me, God used this passion and motivation to eventually show me that He wanted me to be involved in Christian engineering education as well, to pass along this perspective

and to help aspiring Christian engineers to see that their 8-5 journey each day can be as much a part of their faith walk as their time with their families or their time at church on Sunday. In my experience, my worldview definitely affected my posture and perspective on my work. However, one of my lingering questions (and a question that comes regularly from students as well) is how and when a biblically faithful approach makes a difference in specific day-to-day engineering decisions. Six years ago, this question led me and a couple colleagues to develop guiding principles[1] to help think in a more structured way about engineering work from a biblical perspective. In the years since, I've tried these principles out with students in class and in some of my own scholarship. However, only recently have I had the opportunity to introduce these principles to practicing engineers and get their take on the usefulness of these principles in the real-world engineering environment. This paper presents the results of that work.

A Brief Look at the Guiding Principles

The guiding principles mentioned in the introduction were developed in recognition of the metanarrative of Christ that we find in God's Word. This metanarrative is sometimes summarized as the Creation-Fall-Redemption paradigm, as has been fleshed out by Albert Wolters[2] and many others. By carefully considering the implications that an understanding of Creation-Fall-Redemption have in engineering-related work, five guiding principles have been fleshed out and are briefly stated as:

1. God created us and all things for His glory.
2. Our two-fold (but singular) mandate is to develop and keep God's creation.
3. We are creaturely and finite; we are not saviors.
4. As Christ's hands and feet, we are involved in the alleviation of both human and nonhuman suffering.
5. We live in the already and not yet of Christ's reconciling work.

These principles were fleshed out in a previously-published reference[1]; they are explained in detail there. They have not been presented as the <u>only</u> Christian approach to engineering but rather as a helpful framework that can provide guidance in discerning how to engineer in a way that is integrally Christian. Particular work has already been done in using this framework to evaluate our engineering curriculum[3] and its effectiveness[4].

Before I dive into the work at hand, a bit of elaboration on the purpose of the principles may be helpful. These principles were developed after a lot of discussion on how to really think biblically about engineering. The original goal of this work was not to develop principles; it was merely to work toward a more practical understanding of what it means to do engineering biblically. Thinking back, I think the starting point was a recognition of how difficult it is to know God's particular will toward specific decisions in the trenches of engineering work every day. For example, as I write this paragraph I am sitting in front of a wall painted a deep red with purplish undertones. Based on my current knowledge, I am quite comfortable that it was an obedient and normative decision to paint that wall as such. (And I do feel strongly that there are biblical norms, such as those fleshed out by Monsma et al.[5] and applied by Schuurman[6] that should inform and guide every decision we make.) But there may be something about the decision to paint the wall

that particular color that doesn't follow God's biblical directive as it should. Perhaps an animal or plant outside the adjacent window is adversely affected in a completely unknown way by the reflection of light off that wall color, or maybe there is something about the paint production process that makes that particular color less stewardly in resource conservation, or possibly this color does something psychologically that puts me in a less loving mood. We may actually learn through research one day that one or more of these is true, but hopefully this as a hypothetical example illustrates the almost-infinite and definitely impossible task it is to have confidence that we know God's complete will related to every technological decision we make.

I do not believe it is reasonable to expect God to reveal all such directives to us in our lifetime; such an expectation does not seem to fit the salvation narrative of initial justification and continual sanctification that God reveals in His word for the way He works in our lives. But recognizing the overwhelming nature of discerning God's biblical directive for engineering is not an excuse to quit trying. Hence, we have developed these guiding principles, not to be an exhaustive, prescriptive list of how to engineering Christianly, but to help think through a biblical framework and ask the right questions in seeking to discern God's will for whatever engineering challenge is at hand. Hopefully these principles provide us a better posture to feel the Spirit's guidance in making obedient engineering decisions.

The Approach

The current effort with the guiding principles is to try them on for size in a real-world engineering environment. The approach that I have used for this work is as follows:

1. I asked practicing engineers in a variety of industries whom I know to be professing Christians if they were willing to critique their engineering work through the lens of a biblical framework.
2. For engineers who agreed to participate, I provided the guiding principles in the form shown in Figure 1. This summary format is one that I have used regularly with engineering students over the past few years.
3. I asked participating engineers to provide written reflections on the guiding principles, based on their professional experiences. The prompt I used for this request was, "Write a paragraph or so on each principle, reflecting on how it applies to your professional work (or if it doesn't, why not), being specific if possible."
4. After receiving written reflections from the participating engineers, I convened an in-person meeting to discuss their thoughts on the principles. For the meeting, the prompt questions used were: (a) If you think about your current engineering work, are you able to see ways where the guiding principles might be helpful (either in specific design decisions or approaches, or in posture and vision)? (b) Do you have any critiques (positive or negative) of the principles? (c) Do you have other thoughts on ways other than the principles to challenge each other to do our work faithfully Christianly?
5. Excerpts of the participating engineers' written and verbal responses are gathered by principle in "The Results" section below.

Biblical Guiding Principles for Engineering

Often in engineering it is challenging to envision how God's will revealed in His word plays a direct role in our daily decisions, particularly in the technical decisions that may not feel explicitly "obedient" or "disobedient." I have found it helpful to reflect on five guiding principles that have been developed from what I believe is a proper understanding of the Creation-Fall-Redemption story of Christ in Scripture. These principles can help to inform why and how we do our engineering work as Christians.

1. *The world (and __everything__ in it) was created for God's glory.*
   - "For from him and through him and **for him** are **all things**" (Rom. 11:36).
   - "God's goal at every stage of creation and salvation is to magnify his glory" (J. Piper).

2. *God gave us dominion over creation and instructs us to develop and conserve it (at the same time).*
   - We give creation its proper due by treating it with care that brings healing and renewal and enables it to unfold and grow (L. Kalsbeek, Gen. 1:28, 2:15).

3. *We are creatures...always finite, currently sinful.*
   - Humans are the crown of creation; we have a unique role ... but salvation does not come from the work of our hands (Ps. 8:4-6, Eph. 2:8,9).
   - We are not saviors. We are finite, sinful, and corrupted.

4. *Our sin caused creation's suffering. We have a responsibility to ease suffering by engaging the __human__ and __non-human creation__.*
   - "For the creation was subjected to frustration, not by its own choice, but by the will of the one who subjected it ... the whole creation has been groaning" (Rom. 8:20-22).

5. *We live in the already and not yet of Christ's kingdom.*
   - Christ's kingdom is already here, and one day it will be fully consummated!
   - We work out of gratefulness for Christ's saving work, and we trust Christ to use our work as he wills to fulfill his perfect plan.
   - We work as a reflection of the Spirit's sanctifying work in our lives.

Figure 1: Biblical Guiding Principles for Engineering

The Contributors

The four practicing engineers who agreed to collaborate with me on this work provide a relatively diverse subset of engineering industry connections. All four engineers are Christ-followers who are active in their churches and would identify with evangelical Christianity. Andy Landman is a licensed professional engineer with 21 years of experience in electrical engineering, currently a practicing design engineer and partner at a consulting engineering firm that specializes in commercial building systems. Jeremy Van Beek has 19 years of experience working as a mechanical design engineer in a light manufacturing industry. Jason Wyenberg has 10 years of experience working as a project engineer in a large electrical power distribution design-build company. David Lammers has approximately 8 years of experience as an industrial engineer in manufacturing, the last couple years serving as a materials engineer in a company that specializes

in heat treating. Bringing in my own experience of over 5 years as a structural consulting engineer in heavy industry (prior to my now 11 years of service in academia), we have a relatively broad portfolio of engineering experience among the five of us. As presented in the remainder of the paper, we found a few differences that we experience in trying to approach our work Christianly, but it seems we found even more similarities despite the diversity of our experiences.

The Results

Principle 1: To God's Glory

A couple specific points made by the contributors highlighted the usefulness of this principle. Van Beek (mechanical design in manufacturing) states, "As we use the resources around us and the laws of nature to design/implement systems, we do this for the glory of God. We can have an understanding of the orderliness of the creation and that God has created natural laws that we can use." Along a similar train of thought, Lammers (industrial design and heat treating) makes the following observation: "God is consistent in his upholding of creation; therefore we are able to predict outcomes based on previous results."

In thinking back to my work in structural engineering, I think this principle affected my posture more than my direct work. It helped to motivate me, to keep my head up, and to keep a smile on my face in the cubicle farm of the consulting engineering world. It made a real difference to know that I was working to give God glory and not to give glory to myself. I believe this mindset made a difference for me every day, particularly with my day-to-day attitude. Recognizing that we are working not for our own selfish motivations but for the greater good and ultimately for God's glory provides a different outlook on our work. This posture and mindset may not always result in different design decisions, but it certainly produces a different individual attitude and awareness for the engineer.

An important point that comes to light in the previous paragraph is determining what is the "greater good" and recognizing that we are always dealing with a restricted viewing window in truly knowing what is the greater good. The history of engineering and technology is littered with unintended consequences, some which should have probably been fended off at the pass by better engineering and judgment early on, and some which it is hard to envision anyone could have foreseen. Petroski has written much about the inevitable humanness of engineering[7], which in fact gets fleshed out in the third guiding principle that is considered a bit later in this paper. Hopefully, our awareness of doing things to God's glory pushes us to think even harder about the broader implications of our work and whether the results of our work truly do give God glory.

The flip side of the mindset in the previous paragraph is that we use the idea of doing things to God's glory as a cop-out to do whatever we want. A helpful critique in the process of developing this paper helpfully pointed out this very danger, which is real and is worth addressing. While it may have inferred in past publications related to the principles, I am not sure it has ever been stated that the principles need to all be incorporated as an overarching framework; they cannot be used individually in isolation to somehow "sanctify" a particular decision. A design decision that is justified by saying it gives God glory but yet ravages a particular portion of the creation or oppresses a particular people group or brings suffering in some other way is by no means an

obedient decision. Using a principle to carelessly justify a poor or selfish decision has certainly never been our intent in the use of these guiding principles.

Principle 2: Develop and Keep

This principle generated a few more thoughts from the contributors. Wyenberg (electrical power distribution) observes how he always wants to further his understanding of what he was doing, and he sees this desire to be directly correlated to God's call to have dominion over the creation. Many of the thoughts provided by Lammers fall mostly under this principle, related to the balance of "science" and "art" in material development and treatment methods. Van Beek states, regarding this principle, "We want to design systems that efficiently and effectively use the resources available to us, including time." Landman (commercial building systems) observes, "Each project requires an acknowledgement of our limited resources." In my experience, the "nuts and bolts" of my engineering work fell almost entirely under this principle. As a structural engineer, most days were spent trying to find the most materially and economically stewardly solutions for whatever design challenge was at hand.

Design engineers, whether in the electrical world or the mechanical world or the structural world, have to engage with this principle whether they recognize it or not. Engineering by definition has been involved with "development," and Christian engineers are often quick to embrace God's mandate to us in Genesis 1:28 to "subdue…and have dominion" over the earth. Those involved in industry in the last 150 or so years, and the engineers that have been a part of it, have in many ways made a mess out of this dominion, and we're only starting to realize the extent of it. In the last 10-15 years, engineering professions are realizing this negligence and working harder to encourage better management of our resources, often under the buzz word "sustainability." This focus shift seems to have produced some positive results; however, it seems like typical approaches pit engineering development versus the environment. As Christians, we can be difference-makers in industry by recognizing that it is not about the competing interests of nature domination versus nature worship, but that Genesis 2:15 clearly presents us with a single mandate to develop and keep God's creation. This singular two-fold mandate has been fleshed out previously at this conference[8] and elsewhere[9].

While there is not room in this paper to revisit in depth the ideas that are wrestled with in the mentioned references[8,9], it is worth mentioning that it is not at all the intent of the second principle to justify the ravaging of the nonhuman creation. Genesis 2:15 is a call to us as humans to flourish the creation, which includes both the human and nonhuman creation. Proper implementation of this principle will by all means contemplate how the beauty of the lilies of the field (Matthew 6:28-29) integrates with God's call to responsibly steward His creation.

Principle 3: Creaturely and Finite

All the collaborators had helpful reflections on this principle. Both Landman and Lammers are quick to observe how the knowledge that all of us are flawed is invaluable for interpersonal relationships. Inevitably, engineers and constructors will have different opinions, and acknowledging that no one is perfect can be very helpful in communicating and navigating these differences. The following excerpt from Landman is well-stated:

"Consulting engineering occupies an area of design that can often stretch engineers in uncomfortable ways. Building design teams come together, each member offering their own area of expertise to the project, whether it is architecture, interior design, or structural/civil/mechanical/electrical engineering. Bringing together our different perspectives on design intent, design constraints, and overall project goals can be arduous, difficult, and a great lesson in grace. Each project requires an acknowledgement of our limited resources, as well as large doses of humility and forbearance with each other as finite creatures. For me personally, being able to see others as fellow image bearers, while acknowledging my own fallen and proud nature, is critical to being able to practice grace-filled engineering. Consulting engineering is not only about applying our technical knowledge of the building systems to the problem at hand, but it also involves taking the time to understand our fellow image bearers – those who will use the building, those constructing the building, and those operating as part of the design team. So I am stretched in every building project, stretched to understand each person involved as God's image bearers, stretched to find ways to best use and conserve limited resources, and constantly stretched to bring God glory through my daily work."

Similar to the reflection from Landman, the concept of image bearing related to this principle is brought in by Lammers:

"We are finite sinners who have finite knowledge, but we are created in God's image. As image bearers of the Ultimate Creator that means using our finite creativity and resources to coax out the desired properties. Craftsmanship lies in how you work within the tolerances. In many cases it is ideal to be directly in the middle of the tolerance, but if you know what is occurring afterword and the parts intended use sometimes it is favorable to shift the goal target slightly within the limit to provide the best possible outcome (i.e. avoid unnecessary stress/distortion or provide optimal part hardness for grinding)."

Van Beek also latches onto this principle:

"This affects how we interact with our co-workers every day, our bosses every day, but also those we come in contact with. We have to be mindful of our own human nature and treat others with the grace that God has shown to us. We have to keep an attitude of humility and patience in our interactions with those around us. At the same time, we need to be ready and prepared to confront/deal with words and actions of others. These may just be words and actions that we disagree with or they may be words and actions that are destructive/inhibitive to the work and goals we are trying to achieve as a company and as individuals. We also have to recognize that we don't have all the answers and be open and willing to engage different ways of achieving the goals we have regarding making systems fit the customer's needs in a responsible way."

It does not surprise me that the idea of our creatureliness resonates with Christians in engineering industry. Our culture seems to have a "STEM will save the world" mentality, but as Christians our worldview is different. We recognize that Christ is the only Savior of the world, and that as humans we are deeply flawed because of our fall into sin. Keeping an awareness of our creatureliness close at hand as we do our day-to-day engineering work is valuable and necessary.

I greatly appreciate the collaborators bringing in the idea of image bearing. We fleshed this idea out a bit more in our discussion meeting as well. The principle of us being image bearers of God was not captured very well in the original formation of the principles, and upon further reflection I believe this biblical concept is important enough to highlight as a separate guiding principle. This addition to the principles will be discussed a bit more later in this paper.

Principle 4: Alleviate Suffering

As I have worked with these guiding principles the past several years, this fourth principle is the one that I've most wanted to tweak. The contributions of the collaborators and my subsequent conversations with them have supported this desire. In some ways, it feels like this principle is what engineering is all about. After all, one of most common simplistic definitions of engineering is that it is "problem solving," which is exactly what this principle gets at. However, perhaps the dilemma is that there is a bit too much stuffed into this principle. The statement, "We have a responsibility to ease suffering…" is one that occasionally rubs well-meaning Christians the wrong way. It can feel a little bit like an about-face to say in the previous principle that we are NOT saviors, but then seem to say in this principle that we are responsible to the be the saviors. We are of course called by God in His word to "do justice" and "love mercy" (Micah 6:8), to be "salt" and "light" (Matthew 5:13-16), and to care for "orphans and widows in their affliction" (James 1:27). It is not necessary to tie these directives to our responsibility for sin; the principle will likely be more helpful by simply providing the biblical directive to care for each other.

One of the most helpful collaborator reflections on this principle is from Van Beek, who interestingly brings in the idea of image bearing here (noting that Landman and Lammers both introduced image bearing in Principle 3):

> "Regarding easing suffering by engaging the human creation, we have hourly and daily interactions with co-workers, suppliers, customers. Do we show genuine concern and care for each of them as God's image bearers? What does that look like? Taking direct steps to ease suffering can be hard to quantify, but how we interact with people shows our attitude toward God and them. We can inject the gospel into daily interactions; we can ask about things that are happening in their lives; we can take listen to suggestions willingly; we can challenge and encourage people to think about the lives they are living and why. We need to pray for wisdom for appropriate responses to all the daily interactions we have.

> "We also try to keep in mind how systems will be used and try to design them ergonomically so those using the systems we design can do so more easily and not dislike coming to carry out their work because of a poorly designed system."

One more observation on this principle: Wyenberg mentions how he appreciates this principle because it helps us be aware of how we might be causing suffering ourselves, and it helps us treat each other more respectfully by having this awareness.

The focus of collaborators on personal interactions and human engagement related to this principle is helpful. The lack of focus on "problem solving" is also helpful, as it indicates that perhaps more things should probably be fleshed out from this principle in order for it to serve as intended.

A further note on this principle is that in our original work[1], we felt it was important to flesh out our call to engage both the human and the non-human creation. The mention of the non-human creation is primarily based on what God teaches us in Romans 8:20-22: "For the creation was subjected to futility, not willingly, but because of him who subjected it…For we know that the whole creation has been groaning together in the pains of childbirth until now." The collaborators on this project struggled to articulate engagement of the non-human creation in light of this principle. Upon reflection, I think there are a couple reasons for this difficulty:

1. Scripture gives us very little insight as to the specifics of sin's effect on the natural creation. The Bible provides us precious little information on how the mountains, birds, trees, rivers, etc. existed prior to the Fall. The world that we see around us and all the science we have ever known is based on a world suffering from the effects of the Fall. Consequently, it is difficult and perhaps unhelpful for us to seek to engage the creation with a posture of alleviating the effects of the Fall.
2. The second principle (God's call to develop and keep His creation) already emphasizes the importance of respecting His creation and using it responsibly. Emphasizing this point a second time, except for doing it this time in light of sin and suffering, seems in practice to add confusion rather than clarity.

Principle 5: Already and Not Yet

Over the years, I have appreciated having this principle serve as a bookend with the first principle. Both have similarities in that their strengths are more related to posture and attitude rather than to specific decisions. Van Beek sums it up nicely:

> "Knowing this allows us to live joyful and thankful lives and use the talents and abilities God has given us. When things aren't going right, we can work toward solutions with the attitude that Christ has won the war, so we don't need to be discouraged. We can still forge ahead doing our best while also understanding that not everything will go as planned. Not everything will work exactly like it was planned because the kingdom is not fully here yet. But we know that as long as we are carrying out our tasks for God's glory in service to His kingdom, what we do is meaningful because God has placed us where we are."

God accomplishes His purposes, sometimes through us and sometimes in spite of us, but He always accomplishes his purposes. This awareness gives us joy when things go well and peace when things do not.

Where Do We Go from Here?

It has been a valuable process to engage these principles with practicing professionals who were willing to "try them on for size" so to speak. The process provided very little pushback on the principles but plenty of ideas for minor adjustments that might be helpful. Based on the interaction described in the preceding sections, here are my proposed summary statements for the modified guiding principles, with additions in italics and deletions struck-through.

1. God created us and all things for His glory.
2. Our two-fold (but singular) mandate is to develop and keep God's creation.
3. *We are image bearers.*
4. We are creaturely and finite; we are not saviors.
5. As Christ's hands and feet, we are *called to engage in meeting needs as part of His reconciling work.* ~~involved in the alleviation of both human and non-human suffering.~~
6. We live in the already and not yet of Christ's *kingdom*. ~~reconciling work.~~

It may be valuable to dig into this modified framework a bit more in the future, gathering Scriptural references and providing more depth and explanation for each principle. However, as the main objective of the current effort is to focus on the feedback from practicing engineers, I believe that task is better left for future work. Briefly, my thought on adding "image bearing" as Principle 3 is that it fits best with the "Creation" portion of Creation-Fall-Redemption. In the proposed framework, Principles 1, 2, and 3 tend to align most closely with Creation. Principle 4 bridges between Creation and Fall; we were created creaturely and finite even before the Fall, but certainly our sin as a result of the Fall exacerbates our creaturely and finite tendencies. Principles 5 and 6 bridge between Fall and Redemption. In Principle 5, meeting the needs around us inevitably means addressing the effects of sin, and of course Christ's reconciling work brings us Redemption. In Principle 6, the "already" exists in our current world that still experiences the effects of the Fall, and the "not yet" alludes to the completed Redemption (sometimes referred to as the "Consummation.") The rewording of Principle 5 (formerly principle 4) helps to resolve a bit of the confusion described earlier in the paper while not explicitly detaching this principle from the needs of either the human or the non-human creation. (An important side note on the rewording: it will still be very important to keep both the human and nonhuman creation aspects of this principle at the forefront when wrestling with it, perhaps as one of the primary subpoints of this principle.) Finally, it seems to fit to bring the phrase of Christ's reconciling work in with the re-wording of Principle 5 and therefore to adjust the wording of Principle 6 to instead refer to the kingdom to eliminate redundancy.

I believe this framework of guiding principles can continue to be a valuable resource for Christians, both in academia and industry, who want to discern what it means to be a Christ-follower in their day-to-day engineering work. There is plenty of work that could (and perhaps should) still be done with respect to these principles. Some next steps include:

- Continuing to seek opportunities to engage with brothers and sisters in Christ who work in engineering beyond the walls of academia and are interested in exercising and evaluating these principles in their industry work.

- Comparing the responses of the collaborators in this paper to student responses that I have collected over several years and determining whether similarities or contrasts become evident and whether these observations might provide helpful insight on how to engage the principles within our curriculum.
- Developing a concise display format for the latest modification of the principles, including helpful subpoints, Scriptural references, etc.
- Continuing to wrestle with the implications of the principles and improving them where necessary to provide a manageable biblical framework for evaluation of engineering work.
- Related to the previous subpoint, focusing particularly on the revised Principle 5 and whether it might be better in the end to actually bring the "human and non-human" wording back into the principle itself.

Conclusion

I am thankful that God has provided the opportunity to work with a variety of people who care about pursuing engineering and technology in an integrally Christian way. The development and refinement of the guiding principles presented here has provided a formative journey, and I believe the principles have been helpful in shedding light on what it means to walk faithfully as disciples of Christ in our engineering work. Perhaps just as valuable, or even more so, have been the relationships that have developed and deepened along the way. My prayer is that God will continue to accomplish His purposes through our engineering work.

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