IT-Enabled Innovation
Module Paper 3
MIS 764

Written By:
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Integrative Conceptual Summary

The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before

the invention of the Euro, on the other hand, there isn’t enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it’s autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it’s smartphone, Microsoft canceling it’s music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious

information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process. An interesting concept introduced in this paper is the distinction between different types of innovation: exploratory and exploitative innovation. Exploratory innovation being radical and disruptive, and exploitative innovation being incrementally progressive. Exploratory innovations tend to be higher risk due to high rates of failure, failing three times more often than exploitative innovations, and can sometimes produce innovations that conflict with existing lines of business Polaroid and Kodak were forerunners is digital photography, but developing these products would have conflicted with film based photography products. A contemporary example might be Alphabet's ventures into large language models and generative AI products, which may conflict with its search, and by extension, its ads business.

Disruptive Innovations With IT

An interesting point highlighted in Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age (Hopp et al., 2018) is that disruptive innovations involving technology are not due to radical technological innovations, but rather, the disruptive effect is due largely to innovative business models. Hopp discusses how incumbents typically move upmarket to tailor their existing products to their existing customers' increasingly sophisticated needs, resulting in over-developed specialty products that might not appeal to new customers. New entrants to a market usually start by creating products that appeal to customers at the lower-end of the market, and then move upmarket in a way that disrupts incumbents. Hopp describes this strategy as low-end encroachment. Even though Hopp doesn't use this example, what he describes goes all the way back to the industrial revolution and the development of mass-market cotton and wool textiles, Henry Ford's model T, the development of synthetic fibers to replace silk products. Another, more current example of this would be fintech products. In the research paper On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services (Gomber 2018) most of the functional aspects of fintech products have more or less already existed, but were not widely available, came at an elevated cost, or involved settlement and posting timeframes that were not or are not practical for many segments of the market.

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Innovating With Artificial Intelligence

One of the aspects of Artificial Intelligence I'm most interested in is how

these programs self-adjust based upon new inputs of data or self-refinements of existing models. This happens in a number of ways, and the terminology, concepts, and definitions are elaborated upon in the four assigned articles. Machine Learning is the general concept, the idea that AI can learn from experience; how this occurs is broken into a number of subtypes: reinforcement learning, supervised learning, unsupervised learning, (Benbya et al., 2021) contextual, or in-context learning (Jablonka et al., 2024) and deep learning, which seeks to mimic the way human learning takes place through a system of neural networks, information is broken down into parts and processed in different parts of the network according to different sets of rules (Dwivedi et al., 2021) much in the same way that a human brain might process sight, sound, smell, touch and taste in different parts of the brain. There are a number of other machine learning subtypes, including an adversarial approach where a top level AI artifact is comprised to two or more sub-AI artifacts that exist in a state of conflict with one another, the output of the to level AI is the result of whichever sub-AI dominates the conflict.

Critical Analysis of the Reading

The most critical concept that ties the main twelve articles of the three topics together is Chatterjee et al's conceptual framework of Harmonious Information Technology Affordances (HITA), that a set of information technology artifacts can exist on a continuum of integration to disorder, they can interact on a spectrum from dissonance to synergy, in a state of harmony, or in a state of conflict, and that the capabilities that are afforded and enabled by an information technology artifact are just half of the equation: equally important is how, as Chatterjee points out, a user of an information technology artifact appropriates that artifact. There was an article about how hard it is to recruit AI researchers from incumbent technology companies, with Aravind Srinivas of Perplexity AI being the interview subject of the article (Mok 2024). Srinivas mentions one of the aspects of his company that dissuades potential recruits from joining his firm are the limitations of Perplexity AI's existing computing infrastructure, with one recruit suggesting that it wouldn't be possible to work to work at Perplexity AI unless Perplexity AI had access to "10,000 H100 GPUs" which Srinivas estimates would cost several billions of dollars to acquire, and have a lead time of over half a decade (Mok 2024). One possible workaround would be to implement Chatterjee's concept of appropriation affordances, Srinivas could potentially purchase a cryptocurrency mining, or blockchain hashing company, and appropriate the computing infrastructure for the purposes of Perplexity AI's software as a service business.
The potential appropriation related affordances for artificial intelligence, the most disruptive innovation since the internet itself, are extensive. The reading for Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy (Dwivedi 2021) has a reading time of over eight hours, and it exhibits a strong optimism for for artificial intelligence applications across disciplines, but it also exhibits a strong naivety in one respect: the most commonly listed downsides mentioned are unemployment, and reinforcing stereotypes, and a lack of inclusion in the development process, and maybe a kind of Skynet Scenario, but these hypothetical problems are almost peanuts compared to the unknown unknowns that weren't mentioned in the article, a search for black swan and black swan event show that these words

appear nowhere in the article. Consider that the person responsible for the most deaths in human history, at over 100 million attributed, was a chemical engineer named Thomas Midgley, and consider that he killed those 100 million people by accident (Veritasium 2022, April 22) by extension, It would only require two-fifths of an accident to depopulate California. Consider that large language models have been found to be effective in chemical engineering applications (Jablonka 2024) and in protein engineering as well (Callaway 2024) consider that even the conspiracy theorists who believe COVID-19 was a weaponized pathogen will still assert that it only turned into a pandemic accidentally. Imagine the next atmosphere destroying chemical compounds, or the next COVID-19 pandemic, or the next Potato Famine fungus all coming from some elementary school kids science project while indiscriminately using a large language model as guidance. Imagine the next Tide-Pod challenge coming from some deep-faked generative AI program that results in a Los Angeles sized Jonestown Incident.

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The most critical concept that ties the main twelve articles of the three topics together is Chatterjee et al's conceptual framework of Harmonious Information Technology Affordances (HITA), that a set of information technology artifacts can exist on a continuum of integration to disorder, they can interact on a spectrum from dissonance to synergy, in a state of harmony, or in a state of conflict, and that the capabilities that are afforded and enabled by an information technology artifact are just half of the equation: equally important is how, as Chatterjee points out, a user of an information technology artifact appropriates that artifact. There was an article about how hard it is to recruit AI researchers from incumbent technology companies, with Aravind Srinivas of Perplexity AI being the interview subject of the article (Mok 2024). Srinivas mentions one of the aspects of his company that dissuades potential recruits from joining his firm are the limitations of Perplexity AI's existing computing infrastructure, with one recruit suggesting that it wouldn't be possible to work to work at Perplexity AI unless Perplexity AI had access to "10,000 H100 GPUs" which Srinivas estimates would cost several billions of dollars to acquire, and have a lead time of over half a decade (Mok 2024). One possible workaround would be to implement Chatterjee's concept of appropriation affordances, Srinivas could potentially purchase a cryptocurrency mining, or blockchain hashing company, and appropriate the computing infrastructure for the purposes of Perplexity AI's software as a service business.

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IT-Enabled Innovation
Module Paper 3
MIS 764

Written By:
Vicky Saab
Kelly Miller
Kenneth Larot Yamat
Due: April 7, 2024

Integrative Conceptual Summary

The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but

by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it's autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it's smartphone, Microsoft canceling it's music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process. An interesting concept introduced in this paper is the distinction between different types of innovation: exploratory and exploitative innovation. Exploratory innovation being radical and disruptive, and exploitative innovation being incrementally progressive. Exploratory innovations tend to be higher risk due to high rates of failure, failing three times more often than exploitative innovations, and can sometimes produce innovations that conflict with existing lines of business Polaroid and Kodak were forerunners is digital photography, but developing these products would have conflicted with film based photography products. A contemporary example might be Alphabet's ventures into large language models and generative AI products, which may conflict with its search, and by extension, its ads business.

Disruptive Innovations With IT

An interesting point highlighted in Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age (Hopp et al., 2018) is that disruptive innovations involving technology are not due to radical technological innovations, but rather, the disruptive effect is due largely to innovative business models. Hopp discusses how incumbents typically move upmarket to tailor their existing products to their existing customers' increasingly sophisticated needs, resulting in over-developed specialty products that might not

appeal to new customers. New entrants to a market usually start by creating products that appeal to customers at the lower-end of the market, and then move upmarket in a way that disrupts incumbents. Hopp describes this strategy as low-end encroachment. Even though Hopp doesn't use this example, what he describes goes all the way back to the industrial revolution and the development of mass-market cotton and wool textiles, Henry Ford's model T, the development of synthetic fibers to replace silk products. Another, more current example of this would be fintech products. In the research paper On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services (Gomber 2018) most of the functional aspects of fintech products have more or less already existed, but were not widely available, came at an elevated cost, or involved settlement and posting timeframes that were not or are not practical for many segments of the market.

Elixir Technologies, classified as a medium sized organization, is the subject of a case study in organizational agility, and is the subject of the research paper Agility in responding to disruptive digital innovation: Case study of an SME (Chan et al., 2018). Organizational Agility as a conceptual framework is outlined in detail, and then applied to small to medium sized enterprises, SMEs, where the advantages and disadvantages of being an SME as it pertains to Organizational Agility are analyzed. Elixir Technologies Pivoted multiple times in response to several technological disruptions, switching from business reporting software, to business intelligence software, to business analytics software, switching from off-the-shelf stand-alone products to cloud based delivered services, switching from desktop software products to mobile platform products, and notably, canceling and repurposing a project: they were developing a taxi dispatch product that was disrupted by changes in consumer preferences for ride-hailing services over taxi services, the project was converted into a product related to mass transit stations. It seems odd that they would pivot a taxi related product to a mass transit product, rather than pivoting the taxi product to a ride-hailing product, but this may have been due to the project being under contract, or in cooperation with the government of Singapore.

The two articles Early vs. late adoption of radical information technology innovations across software development organizations: an extension of the disruptive information technology innovation Model (Carlo et al., 2014) and The disruptive nature of information technology innovations: The case of internet computing in systems development Organizations (Lyytinen & Rose 2003) both touch upon similar themes and concepts: the innovation cycle, disruptive innovations, strategies for handling disruptions, but there was one aspect where I think that they may have taken different positions, Lyytinen & Rose (2003) mentioned that companies that don't adopt early enough and innovate quickly enough, often fall hopelessly behind and are not able to catch up with the competition. Carlo et al. (2014) points out that there are often cost advantages to adopting new technologies later on in the innovation cycle. The position that Lyytinen & Rose (2003) take is somewhat intuitive, but I can see Carlo et al's (2014) point in the following scenario: I can imagine a situation where a major conglomerate adopts electric autonomous vehicles for their supply chain and logistics needs, and they do so in a major way, only for the competition, another major conglomerate, to adopt the latest innovations in on-demand manufacturing that render supply chains nearly unnecessary. A very recent, very concrete example of adopting too early might be the $245 million

write-down experienced by Hertz Global Holdings on the book value of its EV fleet (Hertz Global Holdings INC 2024), and that write-down is on top of the accelerated depreciation schedules that automobiles are already subject to. It's possible that this write down may have been avoided had they adopted electric vehicles on such a large scale a few months later. They may have also taken a slower adoption approach as an alternative, buying fewer electric vehicles during any given purchase cycle, and although it's possible that this may have resulted in reduced availability of electric vehicles to Hertz customers, sometimes being out-of-stock just adds to a product's allure in a customer's psychology, exclusivity can be a force that drives demand: the fact that you can't have it makes you want it more.

Innovating With Artificial Intelligence

One of the aspects of Artificial Intelligence I'm most interested in is how these programs self-adjust based upon new inputs of data or self-refinements of existing models. This happens in a number of ways, and the terminology, concepts, and definitions are elaborated upon in the four assigned articles. Machine Learning is the general concept, the idea that AI can learn from experience; how this occurs is broken into a number of subtypes: reinforcement learning, supervised learning, unsupervised learning, (Benbya et al., 2021) contextual, or in-context learning (Jablonka et al., 2024) and deep learning, which seeks to mimic the way human learning takes place through a system of neural networks, information is broken down into parts and processed in different parts of the network according to different sets of rules (Dwivedi et al., 2021) much in the same way that a human brain might process sight, sound, smell, touch and taste in different parts of the brain. There are a number of other machine learning subtypes, including an adversarial approach where a top level AI artifact is comprised to two or more sub-AI artifacts that exist in a state of conflict with one another, the output of the to level AI is the result of whichever sub-AI dominates the conflict.

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IT-Enabled Innovation
Module Paper 3
MIS 764

Written By:
Vicky Saab
Kelly Miller
Kenneth Larot Yamat
Due: April 7, 2024

Integrative Conceptual Summary

The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it’s autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it’s smartphone, Microsoft canceling it’s music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion

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Disruptive Innovations With IT

An interesting point highlighted in Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age (Hopp et al., 2018) is that disruptive innovations involving technology are not due to radical technological innovations, but rather, the disruptive effect is due largely to innovative business models. Hopp discusses how incumbents typically move upmarket to tailor their existing products to their existing customers' increasingly sophisticated needs, resulting in over-developed specialty products that might not appeal to new customers. New entrants to a market usually start by creating products that appeal to customers at the lower-end of the market, and then move upmarket in a way that disrupts incumbents. Hopp describes this strategy as low-end encroachment. Even though Hopp doesn't use this example, what he describes goes all the way back to the industrial revolution and the development of mass-market cotton and wool textiles, Henry Ford's model T, the development of synthetic fibers to replace silk products. Another, more current example of this would be fintech products. In the research paper On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services (Gomber 2018) most of the functional aspects of fintech products have more or less already existed, but were not widely available, came at an elevated cost, or involved settlement and posting timeframes that were not or are not practical for many segments of the market.

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response to several technological disruptions, switching from business reporting software, to business intelligence software, to business analytics software, switching from off-the-shelf stand-alone products to cloud based delivered services, switching from desktop software products to mobile platform products, and notably, canceling and repurposing a project: they were developing a taxi dispatch product that was disrupted by changes in consumer preferences for ride-hailing services over taxi services, the project was converted into a product related to mass transit stations. It seems odd that they would pivot a taxi related product to a mass transit product, rather than pivoting the taxi product to a ride-hailing product, but this may have been due to the project being under contract, or in cooperation with the government of Singapore.

The two articles Early vs. late adoption of radical information technology innovations across software development organizations: an extension of the disruptive information technology innovation Model (Carlo et al., 2014) and The disruptive nature of information technology innovations: The case of internet computing in systems development Organizations (Lyytinen & Rose 2003) both touch upon similar themes and concepts: the innovation cycle, disruptive innovations, strategies for handling disruptions, but there was one aspect where I think that they may have taken different positions, Lyytinen & Rose (2003) mentioned that companies that don't adopt early enough and innovate quickly enough, often fall hopelessly behind and are not able to catch up with the competition. Carlo et al. (2014) points out that there are often cost advantages to adopting new technologies later on in the innovation cycle. The position that Lyytinen & Rose (2003) take is somewhat intuitive, but I can see Carlo et al's (2014) point in the following scenario: I can imagine a situation where a major conglomerate adopts electric autonomous vehicles for their supply chain and logistics needs, and they do so in a major way, only for the competition, another major conglomerate, to adopt the latest innovations in on-demand manufacturing that render supply chains nearly unnecessary. A very recent, very concrete example of adopting too early might be the $245 million write-down experienced by Hertz Global Holdings on the book value of its EV fleet (Hertz Global Holdings INC 2024), and that write-down is on top of the accelerated depreciation schedules that automobiles are already subject to. It's possible that this write down may have been avoided had they adopted electric vehicles on such a large scale a few months later. They may have also taken a slower adoption approach as an alternative, buying fewer electric vehicles during any given purchase cycle, and although it's possible that this may have resulted in reduced availability of electric vehicles to Hertz customers, sometimes being out-of-stock just adds to a product's allure in a customer's psychology, exclusivity can be a force that drives demand: the fact that you can't have it makes you want it more.

Innovating With Artificial Intelligence

One of the aspects of Artificial Intelligence I'm most interested in is how these programs self-adjust based upon new inputs of data or self-refinements of existing models. This happens in a number of ways, and the terminology, concepts, and definitions are elaborated upon in the four assigned articles. Machine Learning is the general concept, the idea that AI can learn from experience; how this occurs

is broken into a number of subtypes: reinforcement learning, supervised learning, unsupervised learning, (Benbya et al., 2021) contextual, or in-context learning (Jablonka et al., 2024) and deep learning, which seeks to mimic the way human learning takes place through a system of neural networks, information is broken down into parts and processed in different parts of the network according to different sets of rules (Dwivedi et al., 2021) much in the same way that a human brain might process sight, sound, smell, touch and taste in different parts of the brain. There are a number of other machine learning subtypes, including an adversarial approach where a top level AI artifact is comprised to two or more sub-AI artifacts that exist in a state of conflict with one another, the output of the to level AI is the result of whichever sub-AI dominates the conflict.

Critical Analysis of the Reading

The most critical concept that ties the main twelve articles of the three topics together is Chatterjee et al's conceptual framework of Harmonious Information Technology Affordances (HITA), that a set of information technology artifacts can exist on a continuum of integration to disorder, they can interact on a spectrum from dissonance to synergy, in a state of harmony, or in a state of conflict, and that the capabilities that are afforded and enabled by an information technology artifact are just half of the equation: equally important is how, as Chatterjee points out, a user of an information technology artifact appropriates that artifact. There was an article about how hard it is to recruit AI researchers from incumbent technology companies, with Aravind Srinivas of Perplexity AI being the interview subject of the article (Mok 2024). Srinivas mentions one of the aspects of his company that dissuades potential recruits from joining his firm are the limitations of Perplexity AI's existing computing infrastructure, with one recruit suggesting that it wouldn't be possible to work to work at Perplexity AI unless Perplexity AI had access to "10,000 H100 GPUs" which Srinivas estimates would cost several billions of dollars to acquire, and have a lead time of over half a decade (Mok 2024). One possible workaround would be to implement Chatterjee's concept of appropriation affordances, Srinivas could potentially purchase a cryptocurrency mining, or blockchain hashing company, and appropriate the computing infrastructure for the purposes of Perplexity AI's software as a service business.
The potential appropriation related affordances for artificial intelligence, the most disruptive innovation since the internet itself, are extensive. The reading for Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy (Dwivedi 2021) has a reading time of over eight hours, and it exhibits a strong optimism for for artificial intelligence applications across disciplines, but it also exhibits a strong naivety in one respect: the most commonly listed downsides mentioned are unemployment, and reinforcing stereotypes, and a lack of inclusion in the development process, and maybe a kind of Skynet Scenario, but these hypothetical problems are almost peanuts compared to the unknown unknowns that weren't mentioned in the article, a search for black swan and black swan event show that these words appear nowhere in the article. Consider that the person responsible for the most deaths in human history, at over 100 million attributed, was a chemical engineer named Thomas Midgley, and consider that he killed those 100 million people by accident (Veritasium 2022, April 22) by extension, It would only require two-fifths

of an accident to depopulate California. Consider that large language models have been found to be effective in chemical engineering applications (Jablonka 2024) and in protein engineering as well (Callaway 2024).

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autonomous vehicles for their supply chain and logistics needs, and they do so in a major way, only for the competition, another major conglomerate, to adopt the latest innovations in on-demand manufacturing that render supply chains nearly unnecessary. A very recent, very concrete example of adopting too early might be the $245 million write-down experienced by Hertz Global Holdings on the book value of its EV fleet (Hertz Global Holdings INC 2024), and that write-down is on top of the accelerated depreciation schedules that automobiles are already subject to. It's possible that this write down may have been avoided had they adopted electric vehicles on such a large scale a few months later. They may have also taken a slower adoption approach as an alternative, buying fewer electric vehicles during any given purchase cycle, and although it's possible that this may have resulted in reduced availability of electric vehicles to Hertz customers, sometimes being out-of-stock just adds to a product's allure in a customer's psychology, exclusivity can be a force that drives demand: the fact that you can't have it makes you want it more.

Innovating With Artificial Intelligence

One of the aspects of Artificial Intelligence I'm most interested in is how these programs self-adjust based upon new inputs of data or self-refinements of existing models. This happens in a number of ways, and the terminology, concepts, and definitions are elaborated upon in the four assigned articles. Machine Learning is the general concept, the idea that AI can learn from experience; how this occurs is broken into a number of subtypes: reinforcement learning, supervised learning, unsupervised learning, (Benbya et al., 2021) contextual, or in-context learning (Jablonka et al., 2024) and deep learning, which seeks to mimic the way human learning takes place through a system of neural networks, information is broken down into parts and processed in different parts of the network according to different sets of rules (Dwivedi et al., 2021) much in the same way that a human brain might process sight, sound, smell, touch and taste in different parts of the brain. There are a number of other machine learning subtypes, including an adversarial approach where a top level AI artifact is comprised to two or more sub-AI artifacts that exist in a state of conflict with one another, the output of the to level AI is the result of whichever sub-AI dominates the conflict.

Critical Analysis of the Reading

The most critical concept that ties the main twelve articles of the three topics together is Chatterjee et al's conceptual framework of Harmonious Information Technology Affordances (HITA), that a set of information technology artifacts can exist on a continuum of integration to disorder, they can interact on a spectrum from dissonance to synergy, in a state of harmony, or in a state of conflict, and that the capabilities that are afforded and enabled by an information technology artifact are just half of the equation: equally important is how, as Chatterjee points out, a user of an information technology artifact appropriates that artifact. There was an article about how hard it is to recruit AI researchers from incumbent technology companies, with Aravind Srinivas of Perplexity AI being the interview subject of the article (Mok 2024). Srinivas mentions one of the aspects of his

company that dissuades potential recruits from joining his firm are the limitations of Perplexity AI's existing computing infrastructure, with one recruit suggesting that it wouldn't be possible to work to work at Perplexity AI unless Perplexity AI had access to "10,000 H100 GPUs" which Srinivas estimates would cost several billions of dollars to acquire, and have a lead time of over half a decade (Mok 2024). One possible workaround would be to implement Chatterjee's concept of appropriation affordances, Srinivas could potentially purchase a cryptocurrency mining, or blockchain hashing company, and appropriate the computing infrastructure for the purposes of Perplexity AI's software as a service business.

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The type of citation provided in APA format for information from the PitchBook Platform about Perplexity would be an online or web-based source citation. This is because the information is retrieved from a website or online platform.

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For in-text citations, you can use the organization name or a shortened version of the title:

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(Perplexity profile, n.d.)

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 so here is the thing I think it should follow a format similar to the one for the bloomberg terminal citation style because
 it's usually the author that comes first, not the name of the article, so the author of the page is PitchBook, not perplexity AI

 it's pitchbook authoring a company profile of

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https://www.poetryfoundation.org/poems/50372/ode-i-5-to-pyrrha

...

Ode I, 5: To Pyrrha
BY HORACE
TRANSLATED BY JOHN MILTON
What slender youth, bedew’d with liquid odors,
Courts thee on roses in some pleasant cave,
Pyrrha? For whom bind’st thou
In wreaths thy golden hair,
Plain in thy neatness? O how oft shall he
Of faith and changed gods complain, and seas
Rough with black winds, and storms
Unwonted shall admire!
Who now enjoys thee credulous, all gold,
Who, always vacant, always amiable
Hopes thee, of flattering gales
Unmindful. Hapless they
To whom thou untried seem’st fair. Me, in my vow’d
Picture, the sacred wall declares to have hung
My dank and dropping weeds
To the stern god of sea.

...

Literal English Translation
What slender boy, drenched in liquid perfumes,
presses hard upon you on many a rose,
Pyrrha, under cover of a pleasing cave?
For whom do you bind back your yellow hair,

Simple with elegance? Alas, how often will he lament
faithlessness and changed gods, and in surprise
He will marvel at
rough waters with black winds,

he who now enjoys you, believing, you are golden,
who hopes that you will be always free, always lovable,
he who is ignorant of the treacherous breeze!
Wretched are they for whom

you, untried, shine. As for me, the sacred wall
with its votive tablet declares that I have
hung up my dripping garments
to the god who rules over the sea.

...

Original Latin

quis multa gracilis te puer in rosa
  perfusus liquidis urget odoribus
      grato, Pyrrha, sub antro?
        cui flavam religas comam,

simplex munditiis? heu quotiens fidem
  mutatosque deos flebit et aspera
      nigris aequora ventis
         emirabitur insolens,

  qui nunc te fruitur credulus aurea,
qui semper vacuam, semper amabilem
      sperat, nescius aurae
         fallacis! miseri, quibus

  intemptata nites. me tabula sacer
  votiva paries indicat uvida
    suspendisse potenti
         vestimenta maris deo.

...

https://en.wikipedia.org/wiki/Lorem_ipsum

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https://www.schwabmoneywise.com/essentials/understanding-fdic-and-sipc-insurance

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IT-Enabled Innovation

Module Paper 3
MIS 764

Written By:
Vicky Saab
Kelly Miller
Kenneth Larot Yamat
Due: April 7, 2024

Integrative Conceptual Summary

The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues

that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it’s autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it’s smartphone, Microsoft canceling it’s music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden

from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process. An interesting concept introduced in this paper is the distinction between different types of innovation: exploratory and exploitative innovation. Exploratory innovation being radical and disruptive, and exploitative innovation being incrementally progressive. Exploratory innovations tend to be higher risk due to high rates of failure, failing three times more often than exploitative innovations, and can sometimes produce innovations that conflict with existing lines of business Polaroid and Kodak were forerunners is digital photography, but developing these products would have conflicted with film based photography products. A contemporary example might be Alphabet's ventures into large language models and generative AI products, which may conflict with its search, and by extension, its ads business.

Disruptive Innovations With IT

An interesting point highlighted in Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age (Hopp et al., 2018) is that disruptive innovations involving technology are not due to radical technological innovations, but rather, the disruptive effect is due largely to innovative business models. Hopp discusses how incumbents typically move upmarket to tailor their existing products to their existing customers' increasingly sophisticated needs, resulting in over-developed specialty products that might not appeal to new customers. New entrants to a market usually start by creating products that appeal to customers at the lower-end of the market, and then move upmarket in a way that disrupts incumbents. Hopp describes this strategy as low-end encroachment. Even though Hopp doesn't use this example, what he describes goes all the way back to the industrial revolution and the development of mass-market cotton and wool textiles, Henry Ford's model T, the development of synthetic fibers to replace silk products. Another, more current example of this would be fintech products. In the research paper On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services (Gomber 2018) most of the functional aspects of fintech products have more or less already existed, but were not widely available, came at an elevated cost, or involved settlement and posting timeframes that were not or are not practical for many segments of the market.

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Critical Analysis of the Reading

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...

2: AI Innovation Typology
Different Current Users
used by credit card companies to detect fraud
ai assistants like siri and alexa
medical uses of AI to detect Illnesses

Professionals need to determine if Artificial intelligence will enhance their professions, or serve to undermine and devalue their professions.

Structured Data
this type of data is schematically standardized and organized
inventory figures sales data production levels stock exchange data
unstructured Data
IoT // social media posts // blog posts // reviews // tweets
IoT - the Internet of things - how objects are connected to the Internet

processes
pre-processes
Natural Language Understanding
converts spoken words into text
statistical modeling and machine learning
computer vision

main processes

problem solving
reasoning
Machine Learning
lets AI systems enhance their performance initially allowed
artificial neural networks - consist of a sequence of layers where data is processed
in one layer before being handed off to and processed by a deeper layer.

outputs
natural language generation
image creation
robotics
Technological discontinuities
when a new technology offers so much of an advantage that no increase in efficiencies, scale, or design to existing technologies can compete
this relates back to
exploratory and disruptive innovation
and
exploitative and incremental innovation

autonomous vehicles

competence enhancing

do not change fundamentals, increase and serve as a tool to existing skills.

competence destroying

render existing skills obsolete

Artificial generalized intelligence - strong AI - to simulate human thought

Applied Artificial Intelligence - for tasks that are commercially viable
Artificial super intelligence -

Things to consider

implementation - there is a need for interoperability between programs - this can be difficult if API's are

not compatible with one another.

Data Quality - the quality of the data used to train AI models could be skewed, Inaccurate, biased, not representative - or poorly defined.

- low quality inputs result in low quality outputs by the AI models.

Privacy Measures - need to be in place to product individuals, large amounts of data are required to train AI models.

3: Artificial Intelligence (AI): Multidisciplinary Perspectives

Two Types or goals
to perform specific tasks
to think like a human

deep neural networks to improve AI, may not improve these tools.
realistic limits of AI, the - it's to serve as a tool, and move up the value chain - while using AI -
the concept of AI replacing humans is a dated concept.

Application domains
The AI literature has identified several separate domains in which the technology can be applied:

Digital Imaging,
Education,
- improve teacher effectiveness
  - tutoring systems
  - library users
  - library processes
  - intelligent narrative technologies
  - staffing requirements
- student engagement
  - game-based learning environments

Government,
Healthcare,
- medical informatics
- loopthink - limitation of medical AI-loopthink
  - type of implicit bias
  - which does not perform correct reappraisal of information or revision

Weak loopthink refers to the intrinsic inability of computer
intelligence to redirect executive

data flow because of its fixed internal
hard writing, un-editable sectors of its operating system, or unalterable
lines of its programme code.
Strong loopthink refers to AI suppression due to internalisation of the ethical framework.

This is interesting - it seems to refer when the AI tool which should train itself in a way that improves itself

Manufacturing,
Robotics and
Supply Chain.

Data Visualizations

Data Challenges
Disagreements about data standards creates challenges
a cardiac imaging - there were - there was a need to standardize data across institutions
issues about transparency and reliability
interpretations of imagery proved to be an obstacle
the dimensionality obstacle

Social Challenges
Unrealistic expectations
not
fear of job losses
fear of loss of participation in society

Human cognitive flexibility
the ability to interpret unstructured data

SME - Society of Manufacturing Engineers
Small and midsize enterprises (SMEs)
are businesses that have revenues, assets, or a number of employees below a certain
threshold. Each country has its own definition of what constitutes a small and midsize enterprise.
- investopedia (2024)

Critically, in subsets of these components, the data science may be handled independently,
for example by
product or cloud suppliers, with different
viewpoints. So the following question arises: how can the inferences
delivered by different AI components be

integrated coherently when they may
be based on
different data, and subject to
different ecosystem conventions
(and the associated
quality differences) (Walton, 2018a; Walton, 2018b)?

This question can be retitled as the discrimination problem

one of the earliest uses of AI was
the chess game computer

different levels of automation are appropriate for different types of tasks
manual
autonomous

how much is given to a human, how much and what kind of input a human user gives to the machine

situational awareness
there is an expectation that there will be increasing issues with situational
awareness because humans don't have the same level of alertness or cognizance of events
that they themselves do not create - whether that change is made by an AI, or another human,
so as more things become automated, and more changes are made - or more actions are made by machines
situational awareness is expected to decrease.

Logistics

Amazon

Uber

Value of AI should be highest when it reaches maturity - unlikely to be commoditized - meaning standardized product or indistinguishable from other AI products.

consumer preferences
can make or assist in providing customers with more
more validated purchasing decisions. frequency of marketing messages
automated bidding on marketing Artifacts
advertising - machines generate content - consumers feel like they are being targeted
people are afraid of AI that they don't really have

a full understanding of

I can't believe how long this article is. it's taking forever to get through.

Marketing Implications

Assists in designing better marketing material
allows advertisers to better understand the data
sales teams to meet their sales targets and goals

AI resulted in reduced production rate at AirBus

"For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air
Bus."

"A production rate is a quantity of production accomplished over a specific period of time and
realistic production rates are the key in determining reasonable contract times for construction projects."

"In manufacturing, production rate is typically measured as the quantity of goods manufactured per hour, day, week, month, or any other relevant time frame."

"For example, let's say that workers at a manufacturing plant can produce 5,000 units per week using 50 hours of labor. As a result,
the production rate per hour would be 100 units (5,000 / 50 hours) minus any defective units. The 100 unit per hour
production rate could be used as a baseline number for comparative purposes. "

"In a wide range of areas AI can be deployed (please see for a recent
review, Duan et al., 2019). For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air"

"Ransbotham, S., Kiron, D., Gerbert, P., & Reeves, M. (2017). Reshaping business with
artificial intelligence: Closing the gap between ambition and action. MIT Sloan
Management Review, 59(1)."
"Gerbert, P., Reeves, M., Ransbotham, S., Kiron, D., & Spira, M. (2018). Global
competition with AI in business: How China

differs. MIT Sloan Management Review
(July)."

Legal and Regulatory Implications

how to determine liability and accountability issues.

fake news and misleading information

Human Rights implications
the right not to be measured
not to participate or be used to train the AI models in question

Government Adoption of AI tools and applications
efficiencies
public hospitals using analytics tools to determine outbreaks
algorithmic opacity - when it's not known, or disclosed how a system works.
public opinion formation through tools like social media
influences public policy directions

Smart Cities and development of
better city design

Social Science Implications

Digital haves and have-nots

disrupts can create new social paradigms
exposes people lower on the social rung to exploitation

Digital inequity, and digital divide

profiling and law enforcement issues. biases may be reinforced

Keeping Humans at the center of the design

Ethical implications of artificial Intelligence have
not been fully contemplated and established

I really can't believe how long this article is. I've been listening to this for I even don't how many

hours. Lord.

Reinforcement Learning
Referenced during GPT 2 development and Meta chat-bot experiments
can have unpredictable results

Deep Max Scores

Framework

Blockchain and Artificial Intelligence

- Reading Completed on 06:47 AM on 03/06/2024

I want to say that the reading took a full 7 hours.

3.1 Leveraging large language models for predictive chemistry

Terminology: Machine Learning
Large Language Model
LLM Training
In context learning - this refers to how the LLM learns about a subject during the course
of a chat session, rather than fine-tuning or training the model directly.
Inverse design - this refers to creating molecular structures - or chemicals - polymers or alloys - that react in a certain way, or have a specific set of properties - I think that it is called inverse design because, rather than creating a chemical, and describing its properties, - the desired properties are described, and then the molecule is designed
Generative Models
MLM - Machine Learning Model
LLM - Large Language Model
First-principles theory
Isomers - This is chemistry related
Polymers- This is chemistry related
Monomers - This is chemistry related
Gaussian process regression - GPR
Generative pretrained transformer - gpt

Applications: Large Language Models and machine learning to chemistry, and physical sciences
Computing, programming, AI, ML, LLM on Physical sciences, chemistry, and predictive
Simulations
Generating a specific type of dispersant - which I think is a kind of soap - generating a
dispersant with a specific set of characteristics

Limitations: The LLM was able to generate molecules using inverse design, or, it was able to
Hypothesize the existence of chemicals with a desired set of characteristics,
But there were instances where the LLM generated invalid chemical structures
Even if an LLM is able to generate a new chemical, that chemical still has to be synthesized
And there are instances where it's not really possible or practical to synthesize the
Chemical generated by the LLM
It can be difficult to train an LLM accurately, or train it well for accuracy because very
large dataset are required, and there are limitations on how many chemicals can be tested and added to a given data set to train an LLM on

Variations: Using a general LLM AI tool (GPT 3) trained on chemistry documents Rather than a
chemistry specific AI tool, or existing chemistry simulation tools conventional machine learning models designed for chemistry
Existing machine learning models represent chemicals or molecular structures
mathematically, or symbolically, or as a kind of code or program that reacts

a certain way, rather than verbally. Existing machine learning models simulate molecular structures in an abstract way, rather than verbally, the approach used in this paper, by these researchers, describes chemicals verbally
The GPT 3 LLM was compared with a gaussian process regression mlm

Reflections: this was a really interesting article - one of the things that I'm wondering is: if copyright
protection isn't or cannot be granted to ai generated text or ai generated artwork, will patents also not be granted to ai generated chemicals? Or AI generated medicines or Pharmaceuticals? Or ai generated chemical compounds.
AI is already used to create novel chemical structures, however, the prevailing AI tools
used for the purpose of generating novel chemical structures are Machine learning models, rather than large language models, this research paper approaches generating novel chemical structures using LLMs rather than MLMs

Intersections: This paper illustrates the concept of IT Affordances - LLMs have certain capabilities, and

how LLMs are appropriated, in this case, an LLM is appropriated for the purpose of creating novel chemical compounds - this article illustrates a novel appropriation of an existing tool.

...

https://www.bloomberg.com/explore/treasury/?utm_medium=Adwords_SEM&utm_campaign=835689&utm_content=AMER_CorpTreasurySEM&utm_source=pdsrch&tactic=835689

https://www.sap.com/products/financial-management/treasury-management.html

https://www.sap.com/products/financial-management/treasury-management.html

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https://www.bloomberg.com/explore/treasury/?utm_medium=Adwords_SEM&utm_source=pdsrch&utm_content=AMER_CorpTreasurySEM&utm_campaign=835689&tactic=835689&gad_source=1&gclid=CjwKCAjwzN-vBhAkEiwAYiO7oIXi2V76yXAeJNul7gTfeLyzTSFmPIAH3eh8VrLvIQC7-eWn21773hoCT2kQAvD_BwE

...

https://help.sap.com/docs/portfolio-category/TREASURY_MANAGEMENT

...

https://help.sap.com/docs/btp/sap-business-technology-platform/developing-node-js-in-cloud-foundry-environment

...

https://help.sap.com/docs/btp/sap-business-technology-platform/programming-languages

...

https://www.concur.com/invoice-lp?pid=ppc&cid=us_bing_web_br_business_travel_policy_and_procedure&ef_id=c3d2d91e2d0817375d69bce6189f0190:G:s&s_kwcid=AL!5224!10!754541492854 61!75454043739651&msclkid=c3d2d91e2d0817375d69bce6189f0190

...

// https://www.ssga.com/us/en/intermediary/etfs/funds/spdr-portfolio-sp-500-etf-splg

...

3.3: Innovating With Artificial Intelligence

1: Artificial Intelligence In Organizations

...

4: Strategic Use Of AI
	Analytical tools for business strategy
		used a tool to review customer reviews on Yelp and similar websites
		and drafted a business strategy or business proposals
I didn’t find this article very useful - I’ve gone over it twice, but - it seems like the author is in citation cluster optimization
		Mode. In some cases, the citation clusters are larger than the written sentence. I’ll probably go over this article a third
		Time.

...

Benbya, H., Pachidi, S., & Jarvenpaa, S. (2021). Special Issue Editorial: Artificial

	Intelligence in Organizations: Implications for Information Systems Research.
	Journal of the Association for Information Systems, 22(2), 281-303.
	https://doi.org/10.17705/1jais.00662

	Machine Learning
	Deep Learning
	In context learning - - Jablonka, K. M., Schwaller, P., Ortega-Guerrero, A., & Smit, B. (2024)
		In context learning is sometimes referred to as contextual learning
	Reinforcement learning - - Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... Williams,

33M. D. (2021)
Transfer Learning
Supervised Learning – another word for training when people talk about training an AI model, they are talking about
supervised learning
Semi-Supervised Learning
Self-Supervised Learning
Unsupervised Learning
Generative Adversarial Networks (GANs)

...

I remember this.
there was something that
I had to do to fix it, but it broke all of my images.
i don't remember exactly what happened, whatever it was
I eventually fixed it, but the images broke.

there was an issue, where, I was trying to commit
something, and whatever it was, it was too large.

Chestnut + Hazel's GitHub Adventures
Adventure # 37 - 11/01/2023 01:13

There is something wrong here. This isn't updating. It's not clear to my why nothing is deploying. My guess is that, I should wait a little bit before i commit and push changes.

...

Adventure # 36 - 10/30/2023 23:55

Sometimes when I get a notification that this or that bill has a payment due, I think to myself: "Didn't I just pay that bill last month?"

...

https://ppubs.uspto.gov/pubwebapp/static/pages/ppubsbasic.html

https://patents.google.com/patent/US8626636B2/en?q=(vanguard)&oq=vanguard

https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees

I wonder if my trademark was ever awarded.

https://tsdr.uspto.gov/#caseNumber=98117827&caseSearchType=US_APPLICATION&caseType=DEFAULT&searchType=statusSearch

It's still under review.

...

https://www.uspto.gov/learning-and-resources/fees-and-payment/uspto-fee-schedule#Patent%20Fees

...

https://patents.google.com/patent/US8626636B2/en?q=(vanguard)&oq=vanguard

https://patents.google.com/patent/US8626636B2/en?q=(vanguard)&oq=vanguard

https://patents.google.com/patent/US8626636B2/en?q=(vanguard)&oq=vanguard

...

https://patents.google.com/patent/US8719138B2/en

...

Generative AI is experimental. Learn more
Yes, Vanguard patented a structure in 2001 that allows them to classify their exchange-traded funds (ETFs) as a share class of their mutual funds. This structure is known as the "ETF-as-a-share-class" or "hub-and-spoke" structure. It allows Vanguard to offer both traditional mutual funds and ETFs as different share classes within the same fund.

ETF Central
The Post-Vanguard Patent Era: Navigating the Evolving ETF Landscape | ETF Central
May 25, 2023

Dividend.com
Vanguard's ETF Patent Expiration: Game Changer for the Investment ...
Nov 3, 2023 — Vanguard developed a patent in 2001 that allows them to classify their ETFs as a share class of their mutual funds. This was a stroke of luck as it allows Vanguard's mutual funds to lean on the ETFs to improve tax efficiency.

Yahoo Finance
As Vanguard's ETF Patent Expires, What Comes Next?
Mar 9, 2023 — Vanguard entered the exchange-traded fund market in 2001 with what seemed like an unquestionable edge: an exclusive patent that allowed it ...
The "ETF-as-a-share-class" structure has some advantages, including:
Easier and cheaper access: Anyone with a brokerage account can buy or sell an ETF, and many brokerages don't charge commissions for ETF trades.
Tax efficiency: Vanguard's mutual funds can lean on the ETFs to improve tax efficiency.

Vanguard introduced its first ETF share class in 2001 with the Vanguard Total Stock Market ETF VTI. The patent has enabled Vanguard to dominate the fund industry since 2001.
This is not professional financial advice. Consulting a financial advisor about your particular circumstances is best.

Vanguard's ETF Patent Expiration: Game Changer for the ...

Dividend.com
https://www.dividend.com › active-etfs-channel › vang...
Nov 3, 2023 — Vanguard developed a patent in 2001 that allows them to classify their ETFs as a share class of their mutual funds. This was a stroke of luck as ...
People also ask
What is Vanguard's ETF patent?
Vanguard developed a patent in 2001 that allows them to classify their ETFs as a share class of their mutual funds.Nov 3, 2023

Vanguard's ETF Patent Expiration: Game Changer for the ...

...

3: The Disruptive Information Technology Innovation Model
Frameworks: “disruptive information technology innovation model (DITIM)
adoption timing
disruptive innovation cycle
Variables that Differ between early and late adopters
(1) adoption rate of radical IT innovations,
(2) strong order effects on downstream innovations related to the amount of innovation,
(3) perceived radicalness of innovations and
(4) strong effects on downstream innovations related to the radicalness of innovation.
DITIM explains innovation patterns over time and articulates their sequence across three types of IT innovations:
(1) bases
(2) processes
(3) services
Radical Innovations
learning barriers - high during early period of innovation cycle,
lower later on due to larger knowledge base

Timelines: 1995–1999, an early period of rapid, broad and deep industry-wide innovation
2000 - onward, a period in which industry-wide innovation slowed,

became dramatically standardized and posed lower learning requirements
for new entrants relative to the earlier stage.

Conclusions: Goals of
(1) demonstrating the importance of considering temporal factors in the study of disruptive innovation
(2) illustrating that innovation types matter when theorizing about IT-innovation creation and adoption
service innovation: primary engine of process innovation during the entire disruptive IT-innovation cycle
Service innovation drives process innovation
base technologies: 'mature' and become more standardized and powerful, they have more significant effects.
process innovations: take more time to mature and evolve
Process innovations: Process innovations may also have early substitutive effects when the causal links between
the base technologies and their effects are poorly understood and are later replaced with complementary
Effects.
Reflections: There is an early and late innovation cycle
And there are early and late adopters of innovations"

4: The Disruptive Nature Of Information Technology Innovations
"Context: This article deals with or addressed how the internet impacted or had an impact in the United States and Finland.
It was written in 2003, it mentions how the distribution of information shifted away from mainframe
distribution to internet distribution
Disruptive Innovation - structural features distinct from interactive processes
disruptive architectural innovations - deviate radically from existing architectures - May be appropriations of
latent technologies or adaptations of latent technologies to new user needs

Innovation Diffusion Trajectory"
"In their simplest form, IT innovations involve only a technological component—changes in hardware and software that are new to an industry or adopters—but they are often augmented with complementary organizational innovations including new forms of cognition, meaning, work process, business process, or organizational structure."
Implications: correct timing in the diffusion of disruptive innovations
Learning curve is often steep
Expertise in multiple areas is extremely rare - dedicated specialists are often required.

Type I system development processes - services
Type II - administrative functions
Type III - core business processes

...

The disruptive nature of information technology
innovations: The case of internet computing in systems development
Organizations.

Early vs. late adoption of
radical information technology innovations across software development
organizations: an extension of the disruptive information technology
innovation
Model.

Carlo, J. L., Gaskin, J., Lyytinen, K., & Rose, G. M. (2014). Early vs. late
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radical information technology innovations across software development
organizations: an extension of the disruptive information technology
innovation
model. Information Systems Journal, 24(6), 537–569.
https://doi.org/10.1111/isj.12039

Lyytinen, K., & Rose, G. M. (2003). The disruptive nature of information technology
innovations: The case of internet computing in systems development
organizations. MIS Quarterly, 27(4), 557-595.
https://doi.org/10.2307/30036549

...

The disruptive nature of information technology
innovations: The case of internet computing in systems development
Organizations.

Early vs. late adoption of
radical information technology innovations across software development
organizations: an extension of the disruptive information technology
innovation
Model.

Carlo, J. L., Gaskin, J., Lyytinen, K., & Rose, G. M. (2014). Early vs. late
adoption of
radical information technology innovations across software development
organizations: an extension of the disruptive information technology

innovation
model. Information Systems Journal, 24(6), 537–569.
https://doi.org/10.1111/isj.12039

Lyytinen, K., & Rose, G. M. (2003). The disruptive nature of information technology innovations: The case of internet computing in systems development organizations. MIS Quarterly, 27(4), 557-595.
https://doi.org/10.2307/30036549

3: The Disruptive Information Technology Innovation Model

Frameworks: “disruptive information technology innovation model (DITIM)
adoption timing
disruptive innovation cycle
Variables that Differ between early and late adopters
(1) adoption rate of radical IT innovations,
(2) strong order effects on downstream innovations related to the amount of innovation,
(3) perceived radicalness of innovations and
(4) strong effects on downstream innovations related to the radicalness of innovation.
DITIM explains innovation patterns over time and articulates their sequence across three types of IT innovations:
(1) bases
(2) processes
(3) services
Radical Innovations
learning barriers - high during early period of innovation cycle,
lower later on due to larger knowledge base

Timelines: 1995–1999, an early period of rapid, broad and deep industry-wide innovation
2000 - onward, a period in which industry-wide innovation slowed,
became dramatically standardized and posed lower learning requirements
for new entrants relative to the earlier stage.

Conclusions: Goals of
(1) demonstrating the importance of considering temporal factors in the study of disruptive innovation
(2) illustrating that innovation types matter when theorizing about IT-innovation creation and adoption
service innovation: primary engine of process innovation during the entire disruptive IT-innovation cycle
Service innovation drives process innovation
base technologies: ‘mature’ and become more standardized and powerful, they have more significant effects.

process innovations: take more time to mature and evolve
Process innovations: Process innovations may also have early substitutive effects when the causal links between
the base technologies and their effects are poorly understood and are later replaced with complementary
Effects.
Reflections: There is an early and late innovation cycle
And there are early and late adopters of innovations”

4: The Disruptive Nature Of Information Technology Innovations
“Context: This article deals with or addressed how the internet impacted or had an impact in the United States and Finland.
It was written in 2003, it mentions how the distribution of information shifted away from mainframe
distribution to internet distribution
Disruptive Innovation - structural features distinct from interactive processes
disruptive architectural innovations - deviate radically from existing architectures - May be appropriations of
latent technologies or adaptations of latent technologies to new user needs

Innovation Diffusion Trajectory”
“In their simplest form, IT innovations involve only a technological component—changes in hardware and software that are new to an industry or adopters—but they are often augmented with complementary organizational innovations including new forms of cognition, meaning, work process, business process, or organizational structure.”
Implications: correct timing in the diffusion of disruptive innovations
Learning curve is often steep
Expertise in multiple areas is extremely rare - dedicated specialists are often required.

Type I system development processes - services
Type II - administrative functions
Type III - core business processes

3.3: Innovating With Artificial Intelligence

1: Artificial Intelligence In Organizations
2: AI Innovation Typology
Different Current Users
used by credit card companies to detect fraud
ai assistants like siri and alexa
medical uses of AI to detect Illnesses

Professionals need to determine if Artificial intelligence will

enhance their professions, or serve to undermine and devalue their professions.

- Structured Data
  - this type of data is schematically standardized and organized
    - inventory figures sales data production levels stock exchange data
- unstructured Data
  - IoT // social media posts // blog posts // reviews // tweets
    - IoT - the Internet of things - how objects are connected to the Internet

- processes
  - pre-processes
    - Natural Language Understanding
      - converts spoken words into text
        - statistical modeling and machine learning
    - computer vision
  - main processes
    - problem solving
    - reasoning
    - Machine Learning
      - lets AI systems enhance their performance initially allowed
      - artificial neural networks - consist of a sequence of layers where data is processed
        - in one layer before being handed off to and processed by a deeper layer.
  - outputs
    - natural language generation
    - image creation
    - robotics
  - Technological discontinuities
    - when a new technology offers so much of an advantage that no increase in efficiencies, scale, or design to existing technologies can compete
      - this relates back to
        - exploratory and disruptive innovation
        - and
        - exploitative and incremental innovation
  - autonomous vehicles
  - competence enhancing

do not change fundamentals, increase and serve as a tool to existing skills.

competence destroying

render existing skills obsolete

Artificial generalized intelligence - strong AI - to simulate human thought

Applied Artificial Intelligence - for tasks that are commercially viable

Artificial super intelligence -

Things to consider

implementation - there is a need for interoperability between programs - this can be difficult if API's are not compatible with one another.

Data Quality - the quality of the data used to train AI models could be skewed, Inaccurate, biased, not representative - or poorly defined.

- low quality inputs result in low quality outputs by the AI models.

Privacy Measures - need to be in place to product individuals, large amounts of data are required to train AI models.

3: Artificial Intelligence (AI): Multidisciplinary Perspectives

Two Types or goals

to perform specific tasks

to think like a human

deep neural networks to improve AI, may not improve these tools.

realistic limits of AI, the - it's to serve as a tool, and move up the value chain - while using AI -

the concept of AI replacing humans is a dated concept.

Application domains

The AI literature has identified several separate domains in which the technology can be applied:

Digital Imaging,
Education,
improve teacher effectiveness
tutoring systems
library users
library processes
intelligent narrative technologies
staffing requirements
student engagement
game-based learning environments
Government,
Healthcare,
medical informatics
loopthink - limitation of medical AI-loopthink
type of implicit bias
which does not perform correct reappraisal of information or revision

Weak loopthink refers to the intrinsic inability of computer
intelligence to redirect executive data flow because of its fixed internal
hard writing, un-editable sectors of its operating system, or unalterable
lines of its programme code.
Strong loopthink refers to AI suppression
due to internalisation of the ethical framework.

This is interesting - it seems to refer when the AI tool which should train itself in a way that improves itself
Manufacturing,
Robotics and
Supply Chain.

Data Visualizations

Data Challenges
Disagreements about data standards creates challenges
a cardiac imaging - there were - there was a need to standardize data across institutions
issues about transparency and reliability
interpretations of imagery proved to be an obstacle
the dimensionality obstacle

Social Challenges
Unrealistic expectations
not

fear of job losses
fear of loss of participation in society

Human cognitive flexibility
the ability to interpret unstructured data

SME - Society of Manufacturing Engineers
Small and midsize enterprises (SMEs)
are businesses that have revenues, assets, or a number of employees below a certain
threshold. Each country has its own definition of what constitutes a small and midsize enterprise.
- investopedia (2024)

Critically, in subsets of these components, the data science may be handled independently,
for example by
product or cloud suppliers, with different
viewpoints. So the following question arises: how can the inferences
delivered by different AI components be

integrated coherently when they may
be based on
different data, and subject to
different ecosystem conventions
(and the associated
quality differences) (Walton, 2018a; Walton, 2018b)?

This question can be retitled as the discrimination problem

one of the earliest uses of AI was
the chess game computer

different levels of automation are appropriate for different types of tasks
manual
autonomous

how much is given to a human, how much and what kind of input a human user gives to the machine

situational awareness
there is an expectation that there will be increasing issues with situational
awareness because humans don't have the same level of alertness or cognizance of events
that they themselves do not create - whether that change is made by an AI, or another human,

so as more things become automated, and more changes are made - or more actions are made by machines
situational awareness is expected to decrease.

Logistics

Amazon

Uber

Value of AI should be highest when it reaches maturity - unlikely to be commoditized - meaning standardized product or indistinguishable from other AI products.

consumer preferences
can make or assist in providing customers with more more validated purchasing decisions. frequency of marketing messages
automated bidding on marketing Artifacts
advertising - machines generate content - consumers feel like they are being targeted
people are afraid of AI that they don't really have a full understanding of

I can't believe how long this article is. it's taking forever to get through.

Marketing Implications

Assists in designing better marketing material
allows advertisers to better understand the data
sales teams to meet their sales targets and goals

AI resulted in reduced production rate at AirBus

"For instance, Ransbotham, Kiron, Gerbert, and Reeves (2017) highlights that AI reduced the production rate in Air Bus."

"A production rate is a quantity of production accomplished over a specific period of time and realistic production rates are the key in determining reasonable contract times for construction projects."

"In manufacturing, production rate is typically measured as the quantity of goods manufactured per hour, day, week, month, or any other relevant time frame."

"For example, let's say that workers at a

manufacturing plant can produce 5,000 units per week using 50 hours of labor. As a result,
the production rate per hour would be 100 units (5,000 / 50 hours) minus any defective units. The 100 unit per hour
production rate could be used as a baseline number for comparative purposes. "

"In a wide range of areas AI can be deployed (please see for a recent
review, Duan et al., 2019). For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air"

"Ransbotham, S., Kiron, D., Gerbert, P., & Reeves, M. (2017). Reshaping business with
artificial intelligence: Closing the gap between ambition and action. MIT Sloan
Management Review, 59(1)."
"Gerbert, P., Reeves, M., Ransbotham, S., Kiron, D., & Spira, M. (2018). Global
competition with AI in business: How China differs. MIT Sloan Management Review
(July)."

Legal and Regulatory Implications

how to determine liability and accountability issues.

fake news and misleading information

Human Rights implications
- the right not to be measured
- not to participate or be used to train the AI models in question

Government Adoption of AI tools and applications
- efficiencies
- public hospitals using analytics tools to determine outbreaks
- algorithmic opacity - when it's not known, or disclosed how a system works.
- public opinion formation through tools like social media
  - influences public policy directions

Smart Cities and development of

better city design

Social Science Implications

Digital haves and have-nots

disrupts can create new social paradigms
exposes people lower on the social rung to exploitation

Digital inequity, and digital divide

profiling and law enforcement issues. biases may be reinforced

Keeping Humans at the center of the design

Ethical implications of artificial Intelligence have not been fully contemplated and established

I really can't believe how long this article is. I've been listening to this for I even don't how many hours. Lord.

Reinforcement Learning

Referenced during GPT 2 development and Meta chat-bot experiments

can have unpredictable results

Deep Max Scores

Framework

Blockchain and Artificial Intelligence

- Reading Completed on 06:47 AM on 03/06/2024

I want to say that the reading took a full 7 hours.

3.1 Leveraging large language models for predictive chemistry

Terminology: Machine Learning

Large Language Model

LLM Training
In context learning - this refers to how the LLM learns about a subject during the course
of a chat session, rather than fine-tuning or training the model directly.
Inverse design - this refers to creating molecular structures - or chemicals - polymers or alloys - that react in a certain way, or have a specific set of properties - I think that it is called inverse design because, rather than creating a chemical, and describing its properties, - the desired properties are described, and then the molecule is designed
Generative Models
MLM - Machine Learning Model
LLM - Large Language Model
First-principles theory
Isomers - This is chemistry related
Polymers- This is chemistry related
Monomers - This is chemistry related
Gaussian process regression - GPR
Generative pretrained transformer - gpt

Applications: Large Language Models and machine learning to chemistry, and physical sciences
Computing, programming, AI, ML, LLM on Physical sciences, chemistry, and predictive
Simulations
Generating a specific type of dispersant - which I think is a kind of soap - generating a dispersant with a specific set of characteristics

Limitations: The LLM was able to generate molecules using inverse design, or, it was able to
Hypothesize the existence of chemicals with a desired set of characteristics,
But there were instances where the LLM generated invalid chemical structures
Even if an LLM is able to generate a new chemical, that chemical still has to be synthesized
And there are instances where it's not really possible or practical to synthesize the
Chemical generated by the LLM
It can be difficult to train an LLM accurately, or train it well for accuracy because very large dataset are required, and there are limitations on how many chemicals can be tested and added to a given data set to train an LLM on

Variations: Using a general LLM AI tool (GPT 3) trained on chemistry documents Rather than a chemistry specific AI tool, or existing chemistry simulation tools conventional machine learning models designed for chemistry

Existing machine learning models represent chemicals or molecular structures
mathematically, or symbolically, or as a kind of code or program that reacts

a certain way, rather than verbally. Existing machine learning models simulate molecular structures in an abstract way, rather than verbally, the approach used in this paper, by these researchers, describes chemicals verbally
The GPT 3 LLM was compared with a gaussian process regression mlm

Reflections: this was a really interesting article - one of the things that I'm wondering is: if copyright
protection isn't or cannot be granted to ai generated text or ai generated artwork, will patents also not be granted to ai generated chemicals? Or AI generated medicines or Pharmaceuticals? Or ai generated chemical compounds.
AI is already used to create novel chemical structures, however, the prevailing AI tools
used for the purpose of generating novel chemical structures are Machine learning models, rather than large language models, this research paper approaches generating novel chemical structures using LLMs rather than MLMs

Intersections: This paper illustrates the concept of IT Affordances - LLMs have certain capabilities, and
how LLMs are appropriated, in this case, an LLM is appropriated for the purpose of creating novel chemical compounds - this article illustrates a novel appropriation of an existing tool.

4: Strategic Use Of AI
Analytical tools for business strategy
used a tool to review customer reviews on Yelp and similar websites
and drafted a business strategy or business proposals
I didn't find this article very useful - I've gone over it twice, but - it seems like the author is in citation cluster optimization
Mode. In some cases, the citation clusters are larger than the written sentence. I'll probably go over this article a third
Time.

Machine Learning
Deep Learning
In context learning - - Jablonka, K. M., Schwaller, P., Ortega-Guerrero, A., & Smit, B. (2024)
In context learning is sometimes referred to as contextual learning
Reinforcement learning - - Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... Williams,
33M. D. (2021)

Transfer Learning
Supervised Learning – another word for training when people talk about training an AI model, they are talking about
supervised learning
Semi-Supervised Learning
Self-Supervised Learning
Unsupervised Learning
Generative Adversarial Networks (GANs)

...

Elixir Technologies - coding changes - programming disruptions - software delivery distribution disruptions - moved from business reporting - to business intelligence software - then to providing this service through the cloud or through a cloud based application. - Developed a system for dispatching taxis to taxi stands, but this was disrupted by ride-hailing services, so the technology was modified to serve mass transit stations Elixir was in a somewhat unique position - since they were in a business reporting, business intelligence, business analytics software business, they often had extensive external network relationships since they had to work with a variety of businesses - through these networks, the leadership teams were often more creative, and more open to new business ideas. Converted the transit system software to a smart-transit software system. from off the shelf packages - to cloud based software as a service - from business reporting software to business analytics software. Had to adapt to mobile devices - pdas - and later to smart phones - to allow delivery of the software to mobile devices

Concepts: Agility is the key factor in surviving disruptions caused by digital innovations - requires the ability to detect and respond to the changes caused by the innovations
Some innovations may require the combination of several different technologies, or may require the maturity of some technologies to occur, prerequisite developments to take place.
SME - do not require large amounts of slack resources - refers to emergency fund style resources - larger organizations require more slack resources in a way that someone with higher monthly expenses may require a larger emergency fund. SMEs tend to have owner/managers who tend to have a mindset or approach that is different from someone who is an employee/manager
External network relationships - people outside a firm who

can assist an SME in various ways, support an SME in
various ways, provide external competencies,
external insights, alternative viewpoints, identify
Opportunities
SME - does experience greater resource constraints compared
to larger organizations
Organizational Ambidexterity - managing exploratory, and
exploitative innovation at the same time.
Exploratory vs Exploitative innovation - in elixer’s case -
mentioned that 3 out of 10 exploitative pilot projects
work out, compared to 1 out of 10 for exploratory
pilot projects
Responding to changes - develop capabilities - preventing
rigidities - sensing requires leadership to have strong
external networks boundary openness
Sensing Capabilities - being able to detect changes in
innovation that can disrupt a business.
SME - has benefits as well as challenges, they don’t require
extensive resource slack, or fall back resources, but
they also don’t have - this also is an issue because
they may not have enough resources to reconfigure the
Business or to adapt in the necessary ways after a
disruption.

...

MIS764.txt

...

2: Agility In Responding To Disruptive Digital Innovation
Focus: small and medium sized enterprises - firms

Terminology: SME - small to medium sized enterprises
DDI - disruptive digital innovation
Rigidity & Agility - refers to or connects to the concept of
organizational inertia and agility

Cases: Kodak - failure to respond to digital photography
Nokia - failure to respond to smartphones
AirBNB - how will it adapt as the market for vacation
rentals becomes increasingly competitive
Uber Technologies -

...

https://ibkrcampus.com/trading-course/ibkr-desktop/?src=tiPlus031124us&eid=4824667&blst=NL-TI_cps_artclbtn

https://ibkrcampus.com/trading-course/ibkr-desktop/?src=tiPlus031124us&eid=4824667&blst=NL-TI_cps_artclbtn

Elixir Technologies

IT-Enabled Innovation
Module Paper 3
MIS 764

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Due: April 7, 2024

Integrative Conceptual Summary

The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is

decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it's autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it's smartphone, Microsoft canceling it's music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful

innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process. An interesting concept introduced in this paper is the distinction between different types of innovation: exploratory and exploitative innovation. Exploratory innovation being radical and disruptive, and exploitative innovation being incrementally progressive. Exploratory innovations tend to be higher risk due to high rates of failure, failing three times more often than exploitative innovations, and can sometimes produce innovations that conflict with existing lines of business Polaroid and Kodak were forerunners is digital photography, but developing these products would have conflicted with film based photography products. A contemporary example might be Alphabet’s ventures into large language models and generative AI products, which may conflict with its search, and by extension, its ads business.

Disruptive Innovations With IT

An interesting point highlighted in Disruptive Innovation: Conceptual Foundations, Empirical Evidence, and Research Opportunities in the Digital Age (Hopp et al., 2018) is that disruptive innovations involving technology are not due to radical technological innovations, but rather, the disruptive effect is due largely to innovative business models. Hopp discusses how incumbents typically move upmarket to tailor their existing products to their existing customers’ increasingly sophisticated needs, resulting in over-developed specialty products that might not appeal to new customers. New entrants to a market usually start by creating products that appeal to customers at the lower-end of the market, and then move upmarket in a way that disrupts incumbents. Hopp describes this strategy as low-end encroachment. Even though Hopp doesn’t use this example, what he describes goes all the way back to the industrial revolution and the development of mass-market cotton and wool textiles, Henry Ford’s model T, the development of synthetic fibers to replace silk products. Another, more current example of this would be fintech products. In the research paper On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services (Gomber 2018) most of the functional aspects of fintech products have more or less already existed, but were not widely available, came at an elevated cost, or involved settlement and posting timeframes that were not or are not practical for many segments of the market.

Innovating With Artificial Intelligence

Critical Analysis of the Reading

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...

Methods: Used language analysis to screen 1078 research papers published between 1978 - 2016
Diffusion patterns
Ex-ante
Ex-post
Post-hoc conclusions
Dynamics: incumbents, established organizations lose ground when innovations occur due to a focus on existing,

sophisticated customers
- It has been suggested that organizations develop units that guard against disruptions rather than focus on customer needs
- Leadership structures that cause organizations to be disrupted, increase the risk of being disrupted, and have difficulties adapting and reacting to disruptions
- Legislative barriers prevented or interfered with the adoption of e-readers in japan - copyrights and intellectual property protections specifically

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3.2: Disruptive Innovations With IT

1: Disruptive Innovation: Conceptual Foundations And Research Opportunities
Disruption:
- The term disruption - Currently Overused - core concepts misunderstood - disruption usually occurs at the lower-end of the market. Incumbents produce over-developed products. New entrants develop inexpensive products.
  - Fintech -
  - Rideshare -
  - Vacation Rentals -
  - Browser software -

- The technology isn’t usually innovative, but the business model is what is disruptive
- Low-end encroachment - movement from the low-end of the market, upstream, to the higher end of the market is Usually something incumbents tend not to pay attention to - and this results in an increased chance of being disrupted
- Industry-Wide or Strategic Disruptions
  - Green Revolution
  - Automation, AI, robotics, drones
  - Sensor Technologies, wireless sensor networks
  - Additive Manufacturing techniques, 3d printing, digital production

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2: Agility In Responding To Disruptive Digital Innovation
Focus: small and medium sized enterprises - firms

Terminology: SME - small to medium sized enterprises

DDI - disruptive digital innovation
Rigidity & Agility - refers to or connects to the concept of organizational inertia and agility

Cases: Kodak - failure to respond to digital photography
Nokia - failure to respond to smartphones
AirBNB - how will it adapt as the market for vacation rentals becomes increasingly competitive
Uber Technologies -
Elixir Technologies - coding changes - programming disruptions - software delivery distribution disruptions - moved from business reporting - to business intelligence software - then to providing this service through the cloud or through a cloud based application. - Developed a system for dispatching taxis to taxi stands, but this was disrupted by ride-hailing services, so the technology was modified to serve mass transit stations Elixir was in a somewhat unique position - since they were in a business reporting, business intelligence, business analytics software business, they often had extensive external network relationships since they had to work with a variety of businesses - through these networks, the leadership teams were often more creative, and more open to new business ideas. Converted the transit system software to a smart-transit software system. from off the shelf packages - to cloud based software as a service - from business reporting software to business analytics software. Had to adapt to mobile devices - pdas - and later to smart phones - to allow delivery of the software to mobile devices

Concepts: Agility is the key factor in surviving disruptions caused by digital innovations - requires the ability to detect and respond to the changes caused by the innovations
Some innovations may require the combination of several different technologies, or may require the maturity of some technologies to occur, prerequisite developments to take place.
SME - do not require large amounts of slack resources - refers to emergency fund style resources - larger organizations require more slack resources in a way that someone with higher monthly expenses may require a larger emergency fund. SMEs tend to have owner/managers who tend to have a mindset or approach that is different from someone who is an employee/manager
External network relationships - people outside a firm who can assist an SME in various ways, support an SME in various ways, provide external competencies, external insights, alternative viewpoints, identify

Opportunities
SME - does experience greater resource constraints compared to larger organizations
Organizational Ambidexterity - managing exploratory, and exploitative innovation at the same time.
Exploratory vs Exploitative innovation - in elixer's case - mentioned that 3 out of 10 exploitative pilot projects
work out, compared to 1 out of 10 for exploratory pilot projects
Responding to changes - develop capabilities - preventing rigidities - sensing requires leadership to have strong
external networks boundary openness
Sensing Capabilities - being able to detect changes in innovation that can disrupt a business.
SME - has benefits as well as challenges, they don't require extensive resource slack, or fall back resources, but
they also don't have - this also is an issue because they may not have enough resources to reconfigure the
Business or to adapt in the necessary ways after a disruption.

3: The Disruptive Information Technology Innovation Model
Frameworks: "disruptive information technology innovation model (DITIM)
adoption timing
disruptive innovation cycle
Variables that Differ between early and late adopters
(1) adoption rate of radical IT innovations,
(2) strong order effects on downstream innovations related to the amount of innovation,
(3) perceived radicalness of innovations and
(4) strong effects on downstream innovations related to the radicalness of innovation.
DITIM explains innovation patterns over time and articulates their sequence across three types of IT innovations:
(1) bases
(2) processes
(3) services
Radical Innovations
learning barriers - high during early period of innovation cycle,
lower later on due to larger knowledge base

Timelines: 1995–1999, an early period of rapid, broad and deep industry-wide innovation
2000 - onward, a period in which industry-wide innovation slowed,
became dramatically standardized and posed lower learning

requirements
for new entrants relative to the earlier stage.

Conclusions: Goals of
(1) demonstrating the importance of considering temporal factors in the study of disruptive innovation
(2) illustrating that innovation types matter when theorizing about IT-innovation creation and adoption
service innovation: primary engine of process innovation during the entire disruptive IT-innovation cycle
Service innovation drives process innovation
base technologies: 'mature' and become more standardized and powerful, they have more significant effects.
process innovations: take more time to mature and evolve
Process innovations: Process innovations may also have early substitutive effects when the causal links between
the base technologies and their effects are poorly understood and are later replaced with complementary
Effects.
Reflections: There is an early and late innovation cycle
And there are early and late adopters of innovations"

4: The Disruptive Nature Of Information Technology Innovations
"Context: This article deals with or addressed how the internet impacted or had an impact in the United States and Finland.
It was written in 2003, it mentions how the distribution of information shifted away from mainframe
distribution to internet distribution
Disruptive Innovation - structural features distinct from interactive processes
disruptive architectural innovations - deviate radically from existing architectures - May be appropriations of
latent technologies or adaptations of latent technologies to new user needs

Innovation Diffusion Trajectory"
"In their simplest form, IT innovations involve only a technological component—changes in hardware and software that are new to an industry or adopters—but they are often augmented with complementary organizational innovations including new forms of cognition, meaning, work process, business process, or organizational structure."
Implications: correct timing in the diffusion of disruptive innovations
Learning curve is often steep
Expertise in multiple areas is extremely rare - dedicated specialists are often required.

Type I system development processes - services

Type II - administrative functions
Type III - core business processes

3.3: Innovating With Artificial Intelligence

1: Artificial Intelligence In Organizations
2: AI Innovation Typology
Different Current Users
used by credit card companies to detect fraud
ai assistants like siri and alexa
medical uses of AI to detect Illnesses

Professionals need to determine if Artificial intelligence will enhance their professions, or serve to undermine and devalue their professions.

Structured Data
this type of data is schematically standardized and organized
inventory figures sales data production levels stock exchange data
unstructured Data
IoT // social media posts // blog posts // reviews // tweets
IoT - the Internet of things - how objects are connected to the Internet

processes
pre-processes
Natural Language Understanding
converts spoken words into text
statistical modeling and machine learning
computer vision

main processes
problem solving
reasoning
Machine Learning
lets AI systems enhance their performance initially allowed
artificial neural networks - consist of a sequence of layers where data is processed
in one layer before being handed off to and processed by a deeper layer.

outputs
natural language generation
image creation
robotics
Technological discontinuities

when a new technology offers so much of an advantage that no increase in efficiencies, scale, or design to existing technologies can compete

this relates back to
exploratory and disruptive innovation

and
exploitative and incremental innovation

autonomous vehicles

competence enhancing

do not change fundamentals, increase and serve as a tool to existing skills.

competence destroying

render existing skills obsolete

Artificial generalized intelligence - strong AI - to simulate human thought

Applied Artificial Intelligence - for tasks that are commercially viable

Artificial super intelligence -

Things to consider

implementation - there is a need for interoperability between programs - this can be difficult if API's are not compatible with one another.

Data Quality - the quality of the data used to train AI models could be skewed, Inaccurate, biased, not representative - or poorly defined.

- low quality inputs result in low quality outputs by the AI models.

Privacy Measures - need to be in place to product individuals, large amounts of data are required to train AI models.

3: Artificial Intelligence (AI): Multidisciplinary Perspectives

Two Types or goals
to perform specific tasks
to think like a human

deep neural networks to improve AI, may not improve these tools.
realistic limits of AI, the - it's to serve as a tool, and move up the value chain - while using AI -
the concept of AI replacing humans is a dated concept.

Application domains
The AI literature has identified several separate domains in which the technology can be applied:

Digital Imaging,
Education,
improve teacher effectiveness
tutoring systems
library users
library processes
intelligent narrative technologies
staffing requirements
student engagement
game-based learning environments
Government,
Healthcare,
medical informatics
loopthink - limitation of medical AI-loopthink
type of implicit bias
which does not perform correct reappraisal of information or revision

Weak loopthink refers to the intrinsic inability of computer
intelligence to redirect executive data flow because of its fixed internal
hard writing, un-editable sectors of its operating system, or unalterable
lines of its programme code.
Strong loopthink refers to AI suppression
due to internalisation of the ethical framework.

This is interesting - it seems to refer when the AI tool which should train itself in a way that improves itself
Manufacturing,
Robotics and
Supply Chain.

Data Visualizations

Data Challenges
Disagreements about data standards creates challenges
a cardiac imaging - there were - there was a need to standardize data across institutions
issues about transparency and reliability
interpretations of imagery proved to be an obstacle
the dimensionality obstacle

Social Challenges
Unrealistic expectations
not
fear of job losses
fear of loss of participation in society

Human cognitive flexibility
the ability to interpret unstructured data

SME - Society of Manufacturing Engineers
Small and midsize enterprises (SMEs)
are businesses that have revenues, assets, or a number of employees below a certain
threshold. Each country has its own definition of what constitutes a small and midsize enterprise.
- investopedia (2024)

Critically, in subsets of these components, the data science may be handled independently,
for example by
product or cloud suppliers, with different
viewpoints. So the following question arises: how can the inferences
delivered by different AI components be

integrated coherently when they may
be based on
different data, and subject to
different ecosystem conventions
(and the associated
quality differences) (Walton, 2018a; Walton, 2018b)?

This question can be retitled as the discrimination problem

one of the earliest uses of AI was
the chess game computer

different levels of automation are appropriate for different types of tasks

manual
autonomous

how much is given to a human, how much and what kind of input a human user gives to the machine

situational awareness
there is an expectation that there will be increasing issues with situational
awareness because humans don't have the same level of alertness or cognizance of events
that they themselves do not create - whether that change is made by an AI, or another human,
so as more things become automated, and more changes are made - or more actions are made by machines
situational awareness is expected to decrease.

Logistics

Amazon

Uber

Value of AI should be highest when it reaches maturity - unlikely to be commoditized - meaning standardized product or indistinguishable from other AI products.

consumer preferences
can make or assist in providing customers with more
more validated purchasing decisions. frequency of marketing messages
automated bidding on marketing Artifacts
advertising - machines generate content - consumers feel like they are being targeted
people are afraid of AI that they don't really have a full understanding of

I can't believe how long this article is. it's taking forever to get through.

Marketing Implications

Assists in designing better marketing material
allows advertisers to better understand the data
sales teams to meet their sales targets and goals

AI resulted in reduced production rate at AirBus

"For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the

production rate in Air
Bus."

"A production rate is a quantity of production accomplished over a specific period of time and
realistic production rates are the key in determining reasonable contract times for construction projects."

"In manufacturing, production rate is typically measured as the quantity of goods manufactured per hour, day, week, month, or any other relevant time frame."

"For example, let's say that workers at a manufacturing plant can produce 5,000 units per week using 50 hours of labor. As a result,
the production rate per hour would be 100 units (5,000 / 50 hours) minus any defective units. The 100 unit per hour
production rate could be used as a baseline number for comparative purposes. "

"In a wide range of areas AI can be deployed (please see for a recent
review, Duan et al., 2019). For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air"

"Ransbotham, S., Kiron, D., Gerbert, P., & Reeves, M. (2017). Reshaping business with
artificial intelligence: Closing the gap between ambition and action. MIT Sloan
Management Review, 59(1)."
"Gerbert, P., Reeves, M., Ransbotham, S., Kiron, D., & Spira, M. (2018). Global
competition with AI in business: How China differs. MIT Sloan Management Review
(July)."

Legal and Regulatory Implications

how to determine liability and accountability issues.

fake news and misleading information

Human Rights implications
the right not to be measured
not to participate or be used to train the

AI models in question

Government Adoption of AI tools and applications
efficiencies
public hospitals using analytics tools to determine outbreaks
algorithmic opacity - when it's not known, or disclosed how a system works.
public opinion formation through tools like social media
influences public policy directions

Smart Cities and development of
better city design

Social Science Implications

Digital haves and have-nots

disrupts can create new social paradigms
exposes people lower on the social rung to exploitation

Digital inequity, and digital divide

profiling and law enforcement issues. biases may be reinforced

Keeping Humans at the center of the design

Ethical implications of artificial Intelligence have
not been fully contemplated and established

I really can't believe how long this article is. I've been listening to this for I even don't how many
hours. Lord.

Reinforcement Learning
Referenced during GPT 2 development and Meta chat-bot experiments
can have unpredictable results

Deep Max Scores

Framework

Blockchain and Artificial Intelligence

- Reading Completed on 06:47 AM on 03/06/2024

I want to say that the reading took a full 7 hours.

3.1 Leveraging large language models for predictive chemistry

Terminology: Machine Learning
Large Language Model
LLM Training
In context learning - this refers to how the LLM learns about a subject during the course
of a chat session, rather than fine-tuning or training the model directly.
Inverse design - this refers to creating molecular structures - or chemicals - polymers or
alloys - that react in a certain way, or have a specific set of properties - I think that it
is called inverse design because, rather than creating a chemical, and describing its
properties, - the desired properties are described, and then the molecule is designed
Generative Models
MLM - Machine Learning Model
LLM - Large Language Model
First-principles theory
Isomers - This is chemistry related
Polymers- This is chemistry related
Monomers - This is chemistry related
Gaussian process regression - GPR
Generative pretrained transformer - gpt

Applications: Large Language Models and machine learning to chemistry, and physical sciences
Computing, programming, AI, ML, LLM on Physical sciences, chemistry, and predictive
Simulations
Generating a specific type of dispersant - which I think is a kind of soap - generating a
dispersant with a specific set of characteristics

Limitations: The LLM was able to generate molecules using inverse design, or, it was able to
Hypothesize the existence of chemicals with a desired set of characteristics,
But there were instances where the LLM generated invalid chemical structures
Even if an LLM is able to generate a new chemical, that chemical still has to be

synthesized
And there are instances where it’s not really possible or practical to synthesize the
Chemical generated by the LLM
It can be difficult to train an LLM accurately, or train it well for accuracy because very
large dataset are required, and there are limitations on how many chemicals can be tested and added to a given data set to train an LLM on

Variations: Using a general LLM AI tool (GPT 3) trained on chemistry documents Rather than a
chemistry specific AI tool, or existing chemistry simulation tools conventional machine learning models designed for chemistry
Existing machine learning models represent chemicals or molecular structures
mathematically, or symbolically, or as a kind of code or program that reacts

a certain way, rather than verbally. Existing machine learning models simulate molecular structures in an abstract way, rather than verbally, the approach used in this paper, by these researchers, describes chemicals verbally
The GPT 3 LLM was compared with a gaussian process regression mlm

Reflections: this was a really interesting article - one of the things that I’m wondering is: if copyright
protection isn’t or cannot be granted to ai generated text or ai generated artwork, will patents also not be granted to ai generated chemicals? Or AI generated medicines or Pharmaceuticals? Or ai generated chemical compounds.
AI is already used to create novel chemical structures, however, the prevailing AI tools
used for the purpose of generating novel chemical structures are Machine learning models, rather than large language models, this research paper approaches generating novel chemical structures using LLMs rather than MLMs

Intersections: This paper illustrates the concept of IT Affordances - LLMs have certain capabilities, and
how LLMs are appropriated, in this case, an LLM is appropriated for the purpose of creating novel chemical compounds - this article illustrates a novel appropriation of an existing tool.

4: Strategic Use Of AI
Analytical tools for business strategy
used a tool to review customer reviews on Yelp and similar websites and drafted a business strategy or business proposals

4.3 Digitalization: Advances and Challenges

4.1.1 Blockchain Research in Information Systems

4.1.3 the Fintech Revolution:

4.2.2 Human Factors in AI and Future of Work

4.3.1 Digital Innovation Review

4.3.2 Unpacking The Difference

4.3.3 Digital Opportunities For Incumbents

4.3.4 Digitalization Ethical Challenge

Module 3
Kenneth

Module 4
Group Paper

4.1. The Landscape of Emerging Technologies Vicky
4.1.1 Blockchain Research in Information Systems Vicky
4.1.2 Editorial Emergent Tech and Organizing Vicky
4.1.3 the Fintech Revolution: Vicky
4.1.4 Quantum Computing and Information Systems Vicky

4.2. The Changing Nature of Work
Kelly
4.2.1 Editorial Future of Work Organizations Society Kelly
4.2.2 Human Factors in AI and Future of Work Kelly
4.2.3 Mental Health and Information Technology Kelly
4.2.4 Waging war from remote cubicles Kelly

4.3 Digitalization: Advances and Challenges Kenneth
Group Presentation
4.3.1 Digital Innovation Review Kenneth
Vicky
4.3.2 Unpacking The Difference Kenneth
Kelly
4.3.3 Digital Opportunities For Incumbents Kenneth
Kenneth
4.3.4 Digitalization Ethical Challenge Kenneth
Kenneth

Group Project

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IT-Enabled Innovation
Module Paper 3
MIS 764

On the Fintech Revolution Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services

Written By:
Vicky Saab
Kelly Miller
Kenneth Larot Yamat
Due: April 7, 2024

Integrative Conceptual Summary
The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high

levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it’s autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it’s smartphone, Microsoft canceling it’s music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process. An interesting concept introduced in this paper is the distinction between different types of innovation: exploratory and exploitative innovation. Exploratory innovation being radical and disruptive, and exploitative

innovation being incrementally progressive. Exploratory innovations tend to be higher risk due to high rates of failure, failing three times more often than exploitative innovations, and can sometimes produce innovations that conflict with existing lines of business Polaroid and Kodak were forerunners is digital photography, but developing these products would have conflicted with film based photography products. A contemporary example might be Alphabet's ventures into large language models and generative AI products, which may conflict with its search, and by extension, its ads business.

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4: Information Technology And Organizational Innovation:
Challenges: Inconsistencies in literature
Limitations on areas of study - Organizational courage - risk tolerance - risk aversion - and fit
Limitations of agency in a corporate context
Concepts: Fit -HITA, and how HITA influences organizational courage
Gestalt - coherence of internal structures
Stratification of Fit: proposes 3 levels of fit Level 1 - Level 2 - Level 3
Actualization - application and implementation
Innovation - 2 types - exploratory - exploitative - exploitative meaning commercializable - actually - it seems both
exploratory and exploitative are for commercial applications - exploratory refers to innovating new
products - exploitative refers to innovating existing products - exploratory innovation is radical -
Exploitative is Incremental. Exploratory innovation is more disruptive.
Actualizing affordances - Requires experimentation, changes, tinkering - these processes can pose a perceived risk
that a less courageous organization may be averse to, and therefore will never benefit from affordances
that are never implemented or actualized.
Moderation - one variable has an effect on another variable, but that intensity of that impact is affected by a
third variable
Mediation - one variable has an effect on another variable, but this effect can only occur through an
intermediate variable, or intermediary, that transmits the effect from the first variable, to the second
Variable

Profile deviation - expectations vs reality
Matching - two variables
Covariance
Gestalt

Frameworks: Agility - the ability to adapt to changing circumstances
Terminology: Organizational Courage - refers to the ability to take risks -

Fit - Alignment and harmony - FIT & HITA refer to the convergence of IT infrastructure and organizational objectives in a way that serves as a catalyst for innovation - fosters innovation
Circumspect - risk averse - risk avoidance - wary or risk
Transitive Effect -
Salience = prevalence -
Parsimonious - used in this context to mean focused
Spurious - dubious or contrived

Conflicts: Exploratory innovation by a firm may create products that conflict with existing product lines the following are a list of companies that innovated products that conflicted with existing products:

Vanguard - passively managed index funds
State Street - Exchange traded funds
Xerox - GUI, Personal Computers
Polaroid - Digital Cameras, digital photography, digital imaging
Alphabet - Large Language Models
Booking holdings - Vacation Rentals
IBM - Personal Computers , Servers
Altria - vape products
Microsoft - Mobile Operating Systems, Mobile Devices
Corteva - Bioengineered crops
Blockbuster - video streaming services
Palm, blackberry, motorola - touchscreen smartphones
DR Horton, Lennar Greystone - Modular construction techniques
Atari - console gaming - computer gaming - multiplayer gaming

Reflections: Affordances must be actualized, having the best tools, having the best technology means nothing if it isn't put into use, it's useless if it isn't used - and it's useless if it isn't used to produce anything, like to innovate new products, or iterate and improve upon existing products. These new innovations have the potential to create uncertainty and perceived risks to an organization, and an organization must have courage to overcome the

fears of risk and uncertainty to actualize technology to innovate.

What the data shows is that the rewards are there for organizations willing to take risks, for organizations that have The organizational courage to take prudent and well calculated risks and address the uncertainties that come with those, rewards, those innovations, however, in order for these rewards to materialize for an Organization, information Technology affordances must be actualized in combination with a strong culture of organizational courage.

There is a point in the article that shows that there is a strong relationship between exploratory and exploitative innovation, that when one measurement measures high, that the other will also measure high. One thing we discussed in class was that, a long series of incremental, exploitative innovations, can result in - or can add up to something similarly to an exploratory, disruptive innovation

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IT-Enabled Innovation
Module Paper 3
MIS 764

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Due: April 7, 2024

Integrative Conceptual Summary
The Relation Between IT And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the authors put forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It's intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee's hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn't enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the authors put forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity and a need for a temporary and improvised solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative and judicial innovations will occur that increase the costs of unsafely operating these businesses.

In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be

measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as poor Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it's autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it's smartphone, Microsoft canceling it's music player, IBM pulling out of the personal computer business, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other. This is an especially interesting discussion within the context of education. There are any number of information technology tools that are forbidden from use in one educational setting or another, but mastery of these information technology tools often sets a person apart just as much as any mastery of some underlying conceptual framework or subject matter would. Perhaps some educators have a fear that information technology use might diminish the learning process, but maybe they should have the courage to think of learning to use information technology as a learning process that enhances, extends upon, and amplifies an underlying learning process.

Disruptive Innovations With IT

Innovating With Artificial Intelligence

Critical Analysis of the Reading

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The Development Workspace for a series of assignments for MIS 764

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Done - Module 1
Vicky
Done - Module 2
Kelly

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– this was basically useless, you can’t print a pdf that has read aloud enabled, a document has to be downloaded, not printed – as a pdf in order for it to be read aloud enabled

Annotations

Testing the presentation - tested inserting videos - creating charts - creating diagrams -

Created slides 21 - 24 - subsequently deleted.

Updated Module paper 3, just the references page

I came across an interesting scholarly article that I want to read, and cite in this paper
So i am skipping to 3.3 of the module 3 paper

Article Read Aloud Set up Area

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McKinsey & Company. (2023, January 19). What is generative AI? McKinsey & Company. https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai

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Module 3: IT-Enabled Innovation

3.1: The Relation Between It And Organizational Innovation

1: The Role Of It In Organizational Innovation

correlations: number of servers to firm performance
computing capacity to firm performance
storage capacity to firm performance
number of patents to it investments
it expertise and firm performance
patents filed to commercialized products
moderate competition stimulates innovation
intense competition depresses innovation

variables: productivity
sales performance
profitability
value added
stock returns
return on investment
Economies of scale
Architectural flexibility
Diminishing returns
Limited impact

influences: firm alignment and orientation
posture
governance
internal conflict
internal and external context
group conflict hinders adoption
actively fostering innovation
informal mechanisms
industry dynamics
gender diversity
Knowledge integration
Key actors

frameworks: resource based view
capabilities based perspective
industry convergence
Organizational innovation system

cases: polaroid - misalignment
xerox - failure to capitalize
yahoo - failure to capitalize
hospitality incumbents - dismissive of disruptors
pharmaceutical companies - r&d failures lead to patent acquisition resulting in depressed firm performance

limitations: knowledge gaps
outcome measurement
Conceptual abstraction hinders implementation

Difficulties in establishing causation between variables

2: The Nonlinear Influence Of Harmonious Information Technology

Frameworks: HITA - Harmonious IT affordance
linear vs Non-linear & quadratic correlations
Affordances not inherent in people or artifacts, but organizational relationships
Distinctions between Affordances & impediments
Resonance - HITA alignment preserves organizational memory
Organizational inertia - delays in implementation
Adaptation
Paradox - tensions between interdependent elements
Exploratory innovation
Exploitative Innovation

limitations: Few studies use non-linear frameworks
Most studies assume linear relationships

Variables: IT Affordance
IT appropriation

Guidance: Promote = positive hita or impede = negative HITA
Either situation can be leveraged to produce innovation
And innovative solutions
Managing tensions to promote innovations
Finding and leveraging existing paradoxes to stimulate innovation - converting tensions into synergies

Examples: New Collaborations tools that don't integrate well with Existing Organizational memory tools, reducing HITA
Counter-intuitive - when innovation increases despite increasing organizational misalignment

Perspectives: IT Affordance misalignment may prevent standardization or an effort toward homogeneity and uniformity - or it may be perceived in this manner - but it is exactly this misalignment that results in novel solutions as disparate structures attempt to integrate with one another.
It's the challenges created by dissonance, and the need to resolve
that dissonance - the conflicts created by that dissonance - that results in innovation, and innovate solutions
Definitions: Positive HITA is when an organization is operating synergistically
Negative HITA is when an organization is operating with

creative
 Dissonance, or, displays paradoxical characteristics
The quadratic relationship between innovation and HITA is that
innovation is increases as synergies increase, but also as dissonance increases
Paradox refers to conflict within an organization, or misalignment within an organization, or dissonance within an organization - even though it may be paradoxical
That innovation can increase as dissonance increases, paradox is not used to describe this phenomenon, the term counter-intuitive is used in this circumstance
Coalignment - in contrast to dissonance - a kind of synergy
Affordance Theory - what information technology allows human users to do - affordance can increase as an operator becomes more adept at using a particular artifact of information technology - affordance is also - it affordance also depends on the goals of the user. - a crm doesn't do much for a person interested in programming - an IDE doesn't do much for a person looking to close a deal.
Types of IT Affordance - Collaborative Affordance - organizational Memory Affordance - process management affordance
Affordance - what is allowed - what is enabled
Organizational inertia - describes the difficulties an organization may have in changing course or changing direction - in HITA terms - HITA = Zero
Orthogonal - do not influence one another, either in a positive
way or a negative way

2.1 Why Microtribes Are Wrecking Company Growth Plans

Dynamics:
Market fragmentation - has been increasing in an increasingly granular way - allowed by changes in how people
connect with one another
Examples of how incumbents have adapted - have to combine some functions - keep other functions separate - these
can be used to describe when organizations
VF Corporation
Match Group
Omnicom
Publicis
Technologies change the way people interact - which changes the sizes of market segments - which changes how
companies manage product lineups - which changes how organizations are segmented
I can demonstrate the non-linear/quadratic/parabolic/u-shaped relationship by using illustrations from
Fragmented organizations - VF Corp. - Match - Meta - Berkshire Hathaway
Integrated Organizations - Apple - Google
Mixed Integrated Organizations - Amazon

3: Strategic Relevance Of Organizational Virtues Enabled By IT

Terminology: COPs - communities of practice - a conceptual framework for Organizations.
Concepts: Improvisation as innovation - improvisation involves developing
novel solutions to address novel situations - and should be
considered a form of innovation - and should be fostered
or promoted by an organization to address urgent and unpredictable, and unanticipated challenges
Organizational Wisdom - required to improvise successfully - has
a positive effect on the ability to improvise
Mediating Variables - Mediating Factors - IT affordance doesn't
have a direct connection to innovation - it's mediated
through virtues and capabilities that can foster or hinder
Innovation.
IT Capabilities are distinct from IT affordances - capabilities refer
to what can be done - affordances, specifically the aspect of
how technology is appropriated for a purpose - how technologies might be used - a GPU could be used for
enhancing a computer game - or processing a large language model - or processing a blockchain or cryptocurrency - a GPU is capable of performing calculations, but what functions a GPU affords to the user
depends on how the user appropriates or uses the GPU or
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Virtues: Courage
Justice - distributive and corrective
Wisdom
Temperance - particularly relevant during periods of radical
organizational change - needed to reduce anxiety, panic,
And Despair that coincides with radical organizational
change - Organizational Temperance serves to prevent or

reduce chaos

Frameworks: The framework for organizational virtues is an extension of the business ethics
Organizational IT affordances - collaborative, process management, and memory - Which in turn enable Organizational Virtues - These organizational virtues
determine the success of organizational improvisation - improvisation is either a form of innovation - or a kind of
process that occurs before innovation - or is a kind of
preliminary step to innovation.

Catalysts: improvisation - turbulent circumstances - spontaneous situations - unprecedented
Circumstances - truncated time horizons
Innovation - enhanced by formalizing the process of improvisation - or establishing or
practicing improvisation - having a process in place specifically for developing
novel solutions to unprecedented situations

Limitations: ninety percent of innovations fail
Research showing reduced significance of information technology on organizational Outcomes
Organizational Wisdom - highest correlative variable to improvisational success - may
potentially be highest among more established incumbent organizations - and less so among more recently established organizations.
In Business Ethics research, the virtue based ethical framework occupies a niche area, even
within the information systems discipline - business ethics, the majority of business
ethics scholarship - focuses on morality (“deontology”) or optimization as an ethical framework (“utilitarianism”)
Research based on subjects or observees or participants based in the united states

3.1 Norfolk Southern Corporation. (224). Form 10-K Annual Report.

Conclusions: The East Palestine, Ohio derailment, cost 1.1 billion is an Example of a lack of a certain organizational virtue, they
had all the technology in place to determine safety issues and set up maintenance to avert the issues, but for
one reason or another, they didn’t take the actions necessary to prevent the disaster

3.2 The Boeing Company. (2024). Form 10-K Annual Report.

Conclusions: Similar to the issues at Norfolk Southern Corporation

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Circumstances - truncated time horizons
Innovation - enhanced by formalizing the process of improvisation - or establishing or
practicing improvisation - having a process in place specifically for developing
novel solutions to unprecedented situations

Limitations: ninety percent of innovations fail
Research showing reduced significance of information technology on organizational Outcomes
Organizational Wisdom - highest correlative variable to improvisational success - may
potentially be highest among more established incumbent organizations - and less so among more recently established organizations.
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4: Information Technology And Organizational Innovation:
Challenges: Inconsistencies in literature
Limitations on areas of study - Organizational courage - risk tolerance - risk aversion - and fit
Limitations of agency in a corporate context
Concepts: Fit -HITA, and how HITA influences organizational courage
Gestalt - coherence of internal structures
Stratification of Fit: proposes 3 levels of fit Level 1 - Level 2 - Level 3
Actualization - application and implementation
Innovation - 2 types - exploratory - exploitative - exploitative meaning commercializable - actually - it seems both exploratory and exploitative are for commercial applications - exploratory refers to innovating new products - exploitative refers to innovating existing products - exploratory innovation is radical - Exploitative is Incremental. Exploratory innovation is more disruptive.
Actualizing affordances - Requires experimentation, changes, tinkering - these processes can pose a perceived risk that a less courageous organization may be averse to, and therefore will never benefit from affordances that are never implemented or actualized.
Moderation - one variable has an effect on another variable, but that intensity of that impact is affected by a third variable
Mediation - one variable has an effect on another variable,

but this effect can only occur through an
intermediate variable, or intermediary, that transmits the effect from the first variable, to the second
Variable
Profile deviation - expectations vs reality
Matching - two variables
Covariance
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Frameworks: Agility - the ability to adapt to changing circumstances
Terminology: Organizational Courage - refers to the ability to take risks -
Fit - Alignment and harmony - FIT & HITA refer to the convergence of IT infrastructure and organizational
objectives in a way that serves as a catalyst for innovation - fosters innovation
Circumspect - risk averse - risk avoidance - wary or risk
Transitive Effect -
Salience = prevalence -
Parsimonious - used in this context to mean focused
Spurious - dubious or contrived

Conflicts: Exploratory innovation by a firm may create products that conflict with existing product lines the following are
a list of companies that innovated products that conflicted with existing products:
Vanguard - passively managed index funds
State Street - Exchange traded funds
Xerox - GUI, Personal Computers
Polaroid - Digital Cameras, digital photography, digital imaging
Alphabet - Large Language Models
Booking holdings - Vacation Rentals
IBM - Personal Computers , Servers
Altria - vape products
Microsoft - Mobile Operating Systems, Mobile Devices
Corteva - Bioengineered crops
Blockbuster - video streaming services
Palm, blackberry, motorola - touchscreen smartphones
DR Horton, Lennar Greystone - Modular construction techniques
Atari - console gaming - computer gaming - multiplayer gaming
Reflections: Affordances must be actualized, having the best tools, having the best technology means nothing if it isn’t put
into use, it’s useless if it isn’t used - and it’s useless if it isn’t used to produce anything, like to innovate new
products, or iterate and improve upon existing products. These new innovations have the potential to create
uncertainty and perceived risks to an organization,

and an organization must have courage to overcome the fears of risk and uncertainty to actualize technology to innovate.
What the data shows is that the rewards are there for organizations willing to take risks, for organizations that have The organizational courage to take prudent and well calculated risks and address the uncertainties that come with those, rewards, those innovations, however, in order for these rewards to materialize for an Organization, information Technology affordances must be actualized in combination with a strong culture of organizational courage.
There is a point in the article that shows that there is a strong relationship between exploratory and exploitative innovation, that when one measurement measures high, that the other will also measure high. One thing we discussed in class was that, a long series of incremental, exploitative innovations, can result in - or can add up to something similarly to an exploratory, disruptive innovation

...

Module 3: IT-Enabled Innovation

3.1: The Relation Between It And Organizational Innovation

1: The Role Of It In Organizational Innovation

correlations: number of servers to firm performance
computing capacity to firm performance
storage capacity to firm performance
number of patents to it investments
it expertise and firm performance
patents filed to commercialized products
moderate competition stimulates innovation
intense competition depresses innovation

variables: productivity
sales performance
profitability
value added
stock returns
return on investment
Economies of scale
Architectural flexibility
Diminishing returns
Limited impact

influences: firm alignment and orientation

posture
governance
internal conflict
internal and external context
group conflict hinders adoption
actively fostering innovation
informal mechanisms
industry dynamics
gender diversity
Knowledge integration
Key actors

frameworks: resource based view
capabilities based perspective
industry convergence
Organizational innovation system

cases: polaroid - misalignment
xerox - failure to capitalize
yahoo - failure to capitalize
hospitality incumbents - dismissive of disruptors
pharmaceutical companies - r&d failures lead to patent acquisition resulting in depressed firm performance

limitations: knowledge gaps
outcome measurement
Conceptual abstraction hinders implementation
Difficulties in establishing causation between variables

2: The Nonlinear Influence Of Harmonious Information Technology

Frameworks: HITA - Harmonious IT affordance
linear vs Non-linear & quadratic correlations
Affordances not inherent in people or artifacts, but organizational relationships
Distinctions between Affordances & impediments
Resonance - HITA alignment preserves organizational memory
Organizational inertia - delays in implementation
Adaptation
Paradox - tensions between interdependent elements
Exploratory innovation
Exploitative Innovation

limitations: Few studies use non-linear frameworks
Most studies assume linear relationships

Variables: IT Affordance
IT appropriation

Guidance: Promote = positive hita or impede = negative HITA
Either situation can be leveraged to produce innovation
And innovative solutions
Managing tensions to promote innovations
Finding and leveraging existing paradoxes to stimulate innovation - converting tensions into synergies

Examples: New Collaborations tools that don't integrate well with Existing Organizational memory tools, reducing HITA
Counter-intuitive - when innovation increases despite increasing organizational misalignment

Perspectives: IT Affordance misalignment may prevent standardization or an effort toward homogeneity and uniformity - or it may be perceived in this manner - but it is exactly this misalignment that results in novel solutions as disparate structures attempt to integrate with one another.
It's the challenges created by dissonance, and the need to resolve
that dissonance - the conflicts created by that dissonance - that results in innovation, and innovate solutions
Definitions: Positive HITA is when an organization is operating synergistically
Negative HITA is when an organization is operating with creative
Dissonance, or, displays paradoxical characteristics
The quadratic relationship between innovation and HITA is that innovation is increases as synergies increase, but also as dissonance increases
Paradox refers to conflict within an organization, or misalignment within an organization, or dissonance within an organization - even though it may be paradoxical
That innovation can increase as dissonance increases, paradox is not used to describe this phenomenon, the term counter-intuitive is used in this circumstance
Coalignment - in contrast to dissonance - a kind of synergy
Affordance Theory - what information technology allows human users to do - affordance can increase as an operator becomes more adept at using a particular artifact of information technology - affordance is also - it affordance also depends on the goals of the user. - a crm doesn't do much for a person interested in programming - an IDE doesn't do much for a person looking to close a deal.
Types of IT Affordance - Collaborative Affordance - organizational Memory Affordance - process management affordance
Affordance - what is allowed - what is enabled
Organizational inertia - describes the difficulties an organization may have in changing course or changing direction - in HITA terms - HITA = Zero
Orthogonal - do not influence one another, either in a

positive
way or a negative way

2.1 Why Microtribes Are Wrecking Company Growth Plans

Dynamics: Market fragmentation - has been increasing in an increasingly granular way - allowed by changes in how people
connect with one another
Examples of how incumbents have adapted - have to combine some functions - keep other functions separate - these
can be used to describe when organizations
VF Corporation
Match Group
Omnicom
Publicis
Technologies change the way people interact - which changes the sizes of market segments - which changes how
companies manage product lineups - which changes how organizations are segmented
I can demonstrate the non-linear/quadratic/parabolic/u-shaped relationship by using illustrations from
Fragmented organizations - VF Corp. - Match - Meta - Berkshire Hathaway
Integrated Organizations - Apple - Google
Mixed Integrated Organizations - Amazon

3: Strategic Relevance Of Organizational Virtues Enabled By IT

Terminology: COPs - communities of practice - a conceptual framework for Organizations.
Concepts: Improvisation as innovation - improvisation involves developing
novel solutions to address novel situations - and should be
considered a form of innovation - and should be fostered
or promoted by an organization to address urgent and unpredictable, and unanticipated challenges
Organizational Wisdom - required to improvise successfully - has
a positive effect on the ability to improvise
Mediating Variables - Mediating Factors - IT affordance doesn’t
have a direct connection to innovation - it’s mediated
through virtues and capabilities that can foster or hinder
Innovation.

IT Capabilities are distinct from IT affordances - capabilities refer to what can be done - affordances, specifically the aspect of how technology is appropriated for a purpose - how technologies might be used - a GPU could be used for enhancing a computer game - or processing a large language model - or processing a blockchain or cryptocurrency - a GPU is capable of performing calculations, but what functions a GPU affords to the user depends on how the user appropriates or uses the GPU or what application the user uses it for.

Virtues: Courage
Justice - distributive and corrective
Wisdom
Temperance - particularly relevant during periods of radical organizational change - needed to reduce anxiety, panic, And Despair that coincides with radical organizational change - Organizational Temperance serves to prevent or reduce chaos

Frameworks: The framework for organizational virtues is an extension of the business ethics
Organizational IT affordances - collaborative, process management, and memory - Which in turn enable
Organizational Virtues - These organizational virtues determine the success of organizational improvisation - improvisation is either a form of innovation - or a kind of process that occurs before innovation - or is a kind of preliminary step to innovation.

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3.2: Disruptive Innovations With It

1: Disruptive Innovation: Conceptual Foundations And Research Opportunities

Disruption: The term disruption - Currently Overused - core concepts misunderstood - disruption usually occurs at the lower-end of the market. Incumbents produce over-developed products. New entrants develop inexpensive products.

Fintech -
Rideshare -
Vacation Rentals -
Browser software -

The technology isn't usually innovative, but the business

model is what is disruptive
Low-end encroachment - movement from the low-end of the market, upstream, to the higher end of the market is
Usually something incumbents tend not to pay attention to - and this results in an increased chance of being disrupted
Industry-Wide or Strategic Disruptions
Green Revolution
Automation, AI, robotics, drones
Sensor Technologies, wireless sensor networks
Additive Manufacturing techniques, 3d printing, digital production
Methods: Used language analysis to screen 1078 research papers published between 1978 - 2016
Diffusion patterns
Ex-ante
Ex-post
Post-hoc conclusions
Dynamics: incumbents, established organizations lose ground when innovations occur due to a focus on existing, sophisticated customers
It has been suggested that organizations develop units that guard against disruptions rather than focus on customer needs
Leadership structures that cause organizations to be disrupted, increase the risk of being disrupted, and have difficulties adapting and reacting to disruptions
Legislative barriers prevented or interfered with the adoption of e-readers in japan - copyrights and intellectual property protections specifically

2: Agility In Responding To Disruptive Digital Innovation
Focus: small and medium sized enterprises - firms

Terminology: SME - small to medium sized enterprises
DDI - disruptive digital innovation
Rigidity & Agility - refers to or connects to the concept of organizational inertia and agility

Cases: Kodak - failure to respond to digital photography
Nokia - failure to respond to smartphones
AirBNB - how will it adapt as the market for vacation rentals becomes increasingly competitive
Uber Technologies -
Elixir Technologies - coding changes - programming disruptions - software delivery distribution disruptions - moved from business reporting - to business

intelligence software - then to providing this service through
the cloud or through a cloud based application. - Developed a system for dispatching taxis to taxi stands,
but this was disrupted by ride-hailing services, so the technology was modified to serve mass transit stations
Elixir was in a somewhat unique position - since they were in a business reporting, business intelligence,
business analytics software business, they often had extensive external network relationships since they
had to work with a variety of businesses - through these networks, the leadership teams were often more
creative, and more open to new business ideas. Converted the transit system software to a smart-transit
software system. from off the shelf packages - to cloud based software as a service - from business reporting
software to business analytics software. Had to adapt to mobile devices - pdas - and later to smart phones -
to allow delivery of the software to mobile devices

Concepts: Agility is the key factor in surviving disruptions caused by digital innovations - requires the ability to detect and
respond to the changes caused by the innovations
Some innovations may require the combination of several different technologies, or may require the maturity of
some technologies to occur, prerequisite developments to take place.
SME - do not require large amounts of slack resources - refers to emergency fund style resources - larger
organizations require more slack resources in a way that someone with higher monthly expenses may require
a larger emergency fund. SMEs tend to have owner/managers who tend to have a mindset or approach that is
different from someone who is an employee/manager
External network relationships - people outside a firm who can assist an SME in various ways, support an SME in
various ways, provide external competencies, external insights, alternative viewpoints, identify
Opportunities
SME - does experience greater resource constraints compared to larger organizations
Organizational Ambidexterity - managing exploratory, and exploitative innovation at the same time.
Exploratory vs Exploitative innovation - in elixer’s case - mentioned that 3 out of 10 exploitative pilot projects
work out, compared to 1 out of 10 for exploratory pilot projects
Responding to changes - develop capabilities - preventing rigidities - sensing requires leadership to have strong
external networks boundary openness
Sensing Capabilities - being able to detect changes in

innovation that can disrupt a business.
SME - has benefits as well as challenges, they don't require extensive resource slack, or fall back resources, but
they also don't have - this also is an issue because they may not have enough resources to reconfigure the
Business or to adapt in the necessary ways after a disruption.

3: The Disruptive Information Technology Innovation Model

Frameworks: "disruptive information technology innovation model (DITIM)
adoption timing
disruptive innovation cycle
Variables that Differ between early and late adopters
(1) adoption rate of radical IT innovations,
(2) strong order effects on downstream innovations related to the amount of innovation,
(3) perceived radicalness of innovations and
(4) strong effects on downstream innovations related to the radicalness of innovation.
DITIM explains innovation patterns over time and articulates their sequence across three types of IT innovations:
(1) bases
(2) processes
(3) services
Radical Innovations
learning barriers - high during early period of innovation cycle,
lower later on due to larger knowledge base

Timelines: 1995–1999, an early period of rapid, broad and deep industry-wide innovation
2000 - onward, a period in which industry-wide innovation slowed,
became dramatically standardized and posed lower learning requirements
for new entrants relative to the earlier stage.

Conclusions: Goals of
(1) demonstrating the importance of considering temporal factors in the study of disruptive innovation
(2) illustrating that innovation types matter when theorizing about IT-innovation creation and adoption
service innovation: primary engine of process innovation during the entire disruptive IT-innovation cycle
Service innovation drives process innovation
base technologies: 'mature' and become more standardized and powerful, they have more significant effects.

process innovations: take more time to mature and evolve
Process innovations: Process innovations may also have early substitutive effects when the causal links between
the base technologies and their effects are poorly understood and are later replaced with complementary
Effects.
Reflections: There is an early and late innovation cycle
And there are early and late adopters of innovations”

4: The Disruptive Nature Of Information Technology Innovations
“Context: This article deals with or addressed how the internet impacted or had an impact in the United States and Finland.
It was written in 2003, it mentions how the distribution of information shifted away from mainframe
distribution to internet distribution
Disruptive Innovation - structural features distinct from interactive processes
disruptive architectural innovations - deviate radically from existing architectures - May be appropriations of
latent technologies or adaptations of latent technologies to new user needs

Innovation Diffusion Trajectory”
“In their simplest form, IT innovations involve only a technological component—changes in hardware and software that are new to an industry or adopters—but they are often augmented with complementary organizational innovations including new forms of cognition, meaning, work process, business process, or organizational structure.”
Implications: correct timing in the diffusion of disruptive innovations
Learning curve is often steep
Expertise in multiple areas is extremely rare - dedicated specialists are often required.

Type I system development processes - services
Type II - administrative functions
Type III - core business processes

3.3: Innovating With Artificial Intelligence

1: Artificial Intelligence In Organizations

Automatically managing business processes
Machine Learning - Automated algorithms for detecting fraudulent financial transactions
- Manufacturing in a factory
- Automated delivery robots
History - Started in 1970's

- Domains such as psychology - linguistics - biology - mathematics - cognitive sciences - neurosciences
- were not initially able to refine their own processes, currently can do refinements of their own processes
- process automation - not considered state of the art - such as robots in a manufacturing of warehouse setting
- used to identify anomalies in data sets

Substitution of unemployment - vs substitution or automation of specific tasks
- Routine
- semi-routine
- cognitive tasks
- non-routine tasks

used for productivity increases

some applications use deep learning and machine learning to refine their own processes
other applications require input from experts to refine their processes

Financial Applications - Insurance Underwriting - Credit approval - Fraud detection - fraudulent transaction identification

2: AI Innovation Typology

Different Current Users
used by credit card companies to detect fraud
ai assistants like siri and alexa
medical uses of AI to detect Illnesses

Professionals need to determine if Artificial intelligence will enhance their professions, or serve to undermine and devalue their professions.

Structured Data
this type of data is schematically standardized and organized
inventory figures sales data production levels stock exchange data
unstructured Data
IoT // social media posts // blog posts // reviews // tweets
IoT - the Internet of things - how objects are connected to the Internet

processes
pre-processes
Natural Language Understanding
converts spoken words into text

statistical modeling and machine learning

computer vision

main processes

problem solving

reasoning

Machine Learning

lets AI systems enhance their performance initially allowed

artificial neural networks - consist of a sequence of layers where data is processed in one layer before being handed off to and processed by a deeper layer.

outputs

natural language generation

image creation

robotics

Technological discontinuities

when a new technology offers so much of an advantage that no increase in efficiencies, scale, or design to existing technologies can compete

this relates back to

exploratory and disruptive innovation

and

exploitative and incremental innovation

autonomous vehicles

competence enhancing

do not change fundamentals, increase and serve as a tool to existing skills.

competence destroying

render existing skills obsolete

Artificial generalized intelligence - strong AI - to simulate human thought

Applied Artificial Intelligence - for tasks that are commercially viable

Artificial super intelligence -

Things to consider

implementation - there is a need for interoperability between programs - this can be difficult if API's are not compatible with one another.

Data Quality - the quality of the data used to train AI models could be skewed, Inaccurate, biased, not representative - or poorly defined.

- low quality inputs result in low quality outputs by the AI models.

Privacy Measures - need to be in place to product individuals, large amounts of data are required to train AI models.

3: Artificial Intelligence (AI): Multidisciplinary Perspectives

Two Types or goals
- to perform specific tasks
- to think like a human

deep neural networks to improve AI, may not improve these tools.

realistic limits of AI, the - it's to serve as a tool, and move up the value chain - while using AI - the concept of AI replacing humans is a dated concept.

Application domains

The AI literature has identified several separate domains in which the technology can be applied:

Digital Imaging,

Education,
- improve teacher effectiveness
  - tutoring systems
  - library users
  - library processes
  - intelligent narrative technologies
  - staffing requirements
- student engagement
  - game-based learning environments

Government,

Healthcare,
- medical informatics
- loopthink - limitation of medical AI-loopthink
  - type of implicit bias

which does not perform correct reappraisal of information or revision

Weak loopthink refers to the intrinsic inability of computer
intelligence to redirect executive data flow because of its fixed internal
hard writing, un-editable sectors of its operating system, or unalterable
lines of its programme code.

Strong loopthink refers to AI suppression
due to internalisation of the ethical framework.

This is interesting - it seems to refer when the AI tool which should train itself in a way that improves itself

Manufacturing,
Robotics and
Supply Chain.

Data Visualizations

Data Challenges
Disagreements about data standards creates challenges
a cardiac imaging - there were - there was a need to standardize data across institutions
issues about transparency and reliability
interpretations of imagery proved to be an obstacle
the dimensionality obstacle

Social Challenges
Unrealistic expectations
not
fear of job losses
fear of loss of participation in society

Human cognitive flexibility
the ability to interpret unstructured data

SME - Society of Manufacturing Engineers
Small and midsize enterprises (SMEs)
are businesses that have revenues, assets, or a number of employees below a certain
threshold. Each country has its own definition of what constitutes a small and midsize enterprise.
- investopedia (2024)

Critically, in subsets of these components, the data science may be handled independently,
for example by
product or cloud suppliers, with different
viewpoints. So the following question arises: how can the inferences
delivered by different AI components be

integrated coherently when they may
be based on
different data, and subject to
different ecosystem conventions
(and the associated
quality differences) (Walton, 2018a; Walton, 2018b)?

This question can be retitled as the discrimination problem

one of the earliest uses of AI was
the chess game computer

different levels of automation are appropriate for different types of tasks
manual
autonomous

how much is given to a human, how much and what kind of input a human user gives to the machine

situational awareness
there is an expectation that there will be increasing issues with situational
awareness because humans don't have the same level of alertness or cognizance of events
that they themselves do not create - whether that change is made by an AI, or another human,
so as more things become automated, and more changes are made - or more actions are made by machines
situational awareness is expected to decrease.

Logistics

Amazon

Uber

Value of AI should be highest when it reaches maturity - unlikely to be commoditized - meaning standardized product or indistinguishable from other AI products.

consumer preferences

can make or assist in providing customers with more more validated purchasing decisions. frequency of marketing messages

automated bidding on marketing Artifacts

advertising - machines generate content - consumers feel like they are being targeted

people are afraid of AI that they don't really have a full understanding of

I can't believe how long this article is. it's taking forever to get through.

Marketing Implications

Assists in designing better marketing material

allows advertisers to better understand the data

sales teams to meet their sales targets and goals

AI resulted in reduced production rate at AirBus

"For instance, Ransbotham, Kiron, Gerbert, and Reeves (2017) highlights that AI reduced the production rate in Air Bus."

"A production rate is a quantity of production accomplished over a specific period of time and realistic production rates are the key in determining reasonable contract times for construction projects."

"In manufacturing, production rate is typically measured as the quantity of goods manufactured per hour, day, week, month, or any other relevant time frame."

"For example, let's say that workers at a manufacturing plant can produce 5,000 units per week using 50 hours of labor. As a result, the production rate per hour would be 100 units (5,000 / 50 hours) minus any defective units. The 100 unit per hour production rate could be used as a baseline number for comparative purposes. "

"In a wide range of areas AI can be deployed (please see for a recent review, Duan et al., 2019). For instance, Ransbotham, Kiron, Gerbert, and Reeves (2017) highlights that AI reduced the production rate in Air"

"Ransbotham, S., Kiron, D., Gerbert, P., & Reeves, M. (2017). Reshaping business with artificial intelligence: Closing the gap between ambition and action. MIT Sloan Management Review, 59(1)."

"Gerbert, P., Reeves, M., Ransbotham, S., Kiron, D., & Spira, M. (2018). Global competition with AI in business: How China differs. MIT Sloan Management Review (July)."

Legal and Regulatory Implications

how to determine liability and accountability issues.

fake news and misleading information

Human Rights implications
- the right not to be measured
- not to participate or be used to train the AI models in question

Government Adoption of AI tools and applications
- efficiencies
- public hospitals using analytics tools to determine outbreaks
- algorithmic opacity - when it's not known, or disclosed how a system works.
- public opinion formation through tools like social media
  - influences public policy directions

Smart Cities and development of
- better city design

Social Science Implications

Digital haves and have-nots

disrupts can create new social paradigms
- exposes people lower on the social rung to exploitation

Digital inequity, and digital divide

profiling and law enforcement issues. biases may be reinforced

Keeping Humans at the center of the design

Ethical implications of artificual Intelligence have not been fully contemplated and established

I really can't believe how long this article is. I've been listening to this for I even don't how many hours. Lord.

Reinforcement Learning

Referenced during GPT 2 development and Meta chat-bot experiments

can have unpredictable results

Deep Max Scores

Framework

Blockchain and Artificial Intelligence

- Reading Completed on 06:47 AM on 03/06/2024

I want to say that the reading took a full 7 hours.

3.1 Leveraging large language models for predictive chemistry

Terminology: Machine Learning

Large Language Model

LLM Training

In context learning - this refers to how the LLM learns about a subject during the course of a chat session, rather than fine-tuning or training the model directly.

Inverse design - this refers to creating molecular structures - or chemicals - polymers or alloys - that react in a certain way, or have a specific set of properties - I think that it is called inverse design because, rather than creating a chemical, and describing its properties, - the desired properties are described, and then the molecule is designed

Generative Models

MLM - Machine Learning Model

LLM - Large Language Model

First-principles theory

Isomers - This is chemistry related

Polymers- This is chemistry related

Monomers - This is chemistry related

Gaussian process regression - GPR

Generative pre-trained transformer - gpt

Applications: Large Language Models and machine learning to chemistry, and physical sciences

Computing, programming, AI, ML, LLM on Physical sciences, chemistry, and predictive Simulations

Generating a specific type of dispersant - which I think is a kind of soap - generating a dispersant with a specific set of characteristics

Limitations: The LLM was able to generate molecules using inverse design, or, it was able to Hypothesize the existence of chemicals with a desired set of characteristics,

But there were instances where the LLM generated invalid chemical structures

Even if an LLM is able to generate a new chemical, that chemical still has to be synthesized

And there are instances where it’s not really possible or practical to synthesize the Chemical generated by the LLM

It can be difficult to train an LLM accurately, or train it well for accuracy because very large dataset are required, and there are limitations on how many chemicals can be tested and added to a given data set to train an LLM on

Variations: Using a general LLM AI tool (GPT 3) trained on chemistry documents Rather than a chemistry specific AI tool, or existing chemistry simulation tools conventional machine learning models designed for chemistry

Existing machine learning models represent chemicals or molecular structures

mathematically, or symbolically, or as a

kind of code or program that reacts
a certain way, rather than verbally. Existing machine learning models simulate
molecular structures in an abstract way, rather than verbally, the approach used in
this paper, by these researchers, describes chemicals verbally
The GPT 3 LLM was compared with a gaussian process regression MLM

Reflections: this was a really interesting article - one of the things that I'm wondering is: if copyright
protection isn't or cannot be granted to AI generated text or ai generated artwork, will patents also not be granted to ai generated chemicals? Or AI generated medicines or Pharmaceuticals? Or ai generated chemical compounds.
AI is already used to create novel chemical structures, however, the prevailing AI tools
used for the purpose of generating novel chemical structures are Machine learning
models, rather than large language models, this research paper approaches
generating novel chemical structures using LLMs rather than MLMs

Intersections: This paper illustrates the concept of IT Affordances - LLMs have certain capabilities, and
how LLMs are appropriated, in this case, an LLM is appropriated for the purpose of creating novel chemical compounds - this article illustrates a novel appropriation of an existing tool.

4: Strategic Use Of AI

Analytical tools for business strategy
used a tool to review customer reviews on Yelp and similar websites
and drafted a business strategy or business proposals

flexibility scale customization speed innovation and decision making

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Module 1
Vicky
Module 2
Kelly
Module 3
Kenneth
Module 4
Group Paper
4.1. The Landscape of Emerging Technologies
Vicky
4.1.1 Blockchain Research in Information Systems Vicky
4.1.2 Editorial Emergent Tech and Organizing Vicky
4.1.3 the Fintech Revolution:
Vicky
4.1.4 Quantum Computing and Information Systems Vicky

4.2. The Changing Nature of Work
Kelly
4.2.1 Editorial Future of Work Organizations Society Kelly
4.2.2 Human Factors in AI and Future of Work Kelly
4.2.3 Mental Health and Information Technology Kelly
4.2.4 Waging war from remote cubicles
Kelly

4.3 Digitalization: Advances and Challenges Kenneth
Group Presentation
4.3.1 Digital Innovation Review
Kenneth Vicky
4.3.2 Unpacking The Difference
Kenneth Kelly
4.3.3 Digital Opportunities For Incumbents
Kenneth Kenneth
4.3.4 Digitalization Ethical Challenge
Kenneth Kenneth

https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/in_text_citations_author_authors.html

...

Module 3: IT-Enabled Innovation

3.1: The Relation Between It And Organizational Innovation

1: The Role Of It In Organizational Innovation

correlations: number of servers to firm performance
computing capacity to firm performance
storage capacity to firm performance
number of patents to it investments
it expertise and firm performance
patents filed to commercialized products
moderate competition stimulates innovation
intense competition depresses innovation

variables: productivity
sales performance
profitability
value added
stock returns
return on investment
Economies of scale
Architectural flexibility
Diminishing returns
Limited impact

influences: firm alignment and orientation
posture
governance
internal conflict
internal and external context
group conflict hinders adoption
actively fostering innovation
informal mechanisms
industry dynamics
gender diversity
Knowledge integration
Key actors

frameworks: resource based view
capabilities based perspective
industry convergence
Organizational innovation system

cases: polaroid - misalignment
xerox - failure to capitalize
yahoo - failure to capitalize
hospitality incumbents - dismissive of disruptors

pharmaceutical companies - r&d failures lead to patent acquisition resulting in depressed firm performance

limitations: knowledge gaps
outcome measurement
Conceptual abstraction hinders implementation
Difficulties in establishing causation between variables

2: The Nonlinear Influence Of Harmonious Information Technology

Frameworks: HITA - Harmonious IT affordance
linear vs Non-linear & quadratic correlations
Affordances not inherent in people or artifacts, but organizational relationships
Distinctions between Affordances & impediments
Resonance - HITA alignment preserves organizational memory
Organizational inertia - delays in implementation
Adaptation
Paradox - tensions between interdependent elements
Exploratory innovation
Exploitative Innovation

limitations: Few studies use non-linear frameworks
Most studies assume linear relationships

Variables: IT Affordance
IT appropriation

Guidance: Promote = positive hita or impede = negative HITA
Either situation can be leveraged to produce innovation
And innovative solutions
Managing tensions to promote innovations
Finding and leveraging existing paradoxes to stimulate innovation - converting tensions into synergies

Examples: New Collaborations tools that don’t integrate well with Existing Organizational memory tools, reducing HITA
Counter-intuitive - when innovation increases despite increasing organizational misalignment

Perspectives: IT Affordance misalignment may prevent standardization or an effort toward homogeneity and uniformity - or it may be perceived in this manner - but it is exactly this misalignment that results in novel solutions as disparate structures attempt to integrate with one another.

It’s the challenges created by dissonance, and the need to resolve
that dissonance - the conflicts created by that dissonance - that results in innovation, and innovate solutions
Definitions: Positive HITA is when an organization is operating synergistically
Negative HITA is when an organization is operating with creative
Dissonance, or, displays paradoxical characteristics
The quadratic relationship between innovation and HITA is that
innovation is increases as synergies increase, but also as dissonance increases
Paradox refers to conflict within an organization, or misalignment within an organization, or dissonance within an organization - even though it may be paradoxical
That innovation can increase as dissonance increases, paradox is not used to describe this phenomenon, the term counter-intuitive is used in this circumstance
Coalignment - in contrast to dissonance - a kind of synergy
Affordance Theory - what information technology allows human users to do - affordance can increase as an operator becomes more adept at using a particular artifact of information technology - affordance is also - it affordance also depends on the goals of the user. - a crm doesn’t do much for a person interested in programming - an IDE doesn’t do much for a person looking to close a deal.
Types of IT Affordance - Collaborative Affordance - organizational Memory Affordance - process management affordance
Affordance - what is allowed - what is enabled
Organizational inertia - describes the difficulties an organization may have in changing course or changing direction - in HITA terms - HITA = Zero
Orthogonal - do not influence one another, either in a positive
way or a negative way

2.1 Why Microtribes Are Wrecking Company Growth Plans

Dynamics: Market fragmentation - has been increasing in an increasingly granular way - allowed by changes in how people
connect with one another
Examples of how incumbents have adapted - have to combine some functions - keep other functions separate - these
can be used to describe when organizations
VF Corporation
Match Group
Omnicom
Publicis
Technologies change the way people interact - which changes the sizes of market segments - which changes how
companies manage product lineups - which changes how organizations are segmented
I can demonstrate the
non-linear/quadratic/parabolic/u-shaped relationship by using illustrations from

Fragmented organizations - VF Corp. - Match - Meta - Berkshire Hathaway
Integrated Organizations - Apple - Google
Mixed Integrated Organizations - Amazon

3: Strategic Relevance Of Organizational Virtues Enabled By IT

Terminology: COPs - communities of practice - a conceptual framework for Organizations.
Concepts: Improvisation as innovation - improvisation involves developing
novel solutions to address novel situations - and should be
considered a form of innovation - and should be fostered
or promoted by an organization to address urgent and unpredictable, and unanticipated challenges
Organizational Wisdom - required to improvise successfully - has
a positive effect on the ability to improvise
Mediating Variables - Mediating Factors - IT affordance doesn’t
have a direct connection to innovation - it’s mediated
through virtues and capabilities that can foster or hinder
Innovation.
IT Capabilities are distinct from IT affordances - capabilities refer
to what can be done - affordances, specifically the aspect of
how technology is appropriated for a purpose - how technologies might be used - a GPU could be used for
enhancing a computer game - or processing a large language model - or processing a blockchain or cryptocurrency - a GPU is capable of performing calculations, but what functions a GPU affords to the user
depends on how the user appropriates or uses the GPU or
what application the user uses it for.

Virtues: Courage
Justice - distributive and corrective
Wisdom
Temperance - particularly relevant during periods of radical

organizational change - needed to reduce anxiety, panic,
And Despair that coincides with radical organizational
change - Organizational Temperance serves to prevent or
reduce chaos

Frameworks: The framework for organizational virtues is an extension of the business ethics
Organizational IT affordances - collaborative, process management, and memory - Which in turn enable
Organizational Virtues - These organizational virtues
determine the success of organizational improvisation -
improvisation is either a form of innovation - or a kind of
process that occurs before innovation - or is a kind of
preliminary step to innovation.

Catalysts: improvisation - turbulent circumstances - spontaneous situations - unprecedented
Circumstances - truncated time horizons
Innovation - enhanced by formalizing the process of improvisation - or establishing or
practicing improvisation - having a process in place specifically for developing
novel solutions to unprecedented situations

Limitations: ninety percent of innovations fail
Research showing reduced significance of information technology on organizational Outcomes
Organizational Wisdom - highest correlative variable to improvisational success - may
potentially be highest among more established incumbent organizations - and less so among more recently established organizations.
In Business Ethics research, the virtue based ethical framework occupies a niche area, even
within the information systems discipline - business ethics, the majority of business
ethics scholarship - focuses on morality (“deontology”) or optimization as an ethical framework (“utilitarianism”)
Research based on subjects or observees or participants based in the united states

3.1 Norfolk Southern Corporation. (224). Form 10-K Annual Report.

Conclusions: The East Palestine, Ohio derailment, cost 1.1 billion is an Example of a lack of a certain organizational virtue, they had all the technology in place to determine safety issues and set up maintenance to avert the issues, but for one reason or another, they didn’t take the actions necessary to prevent the disaster

3.2 The Boeing Company. (2024). Form 10-K Annual Report.

Conclusions: Similar to the issues at Norfolk Southern Corporation

4: Information Technology And Organizational Innovation:

Challenges: Inconsistencies in literature
Limitations on areas of study - Organizational courage - risk tolerance - risk aversion - and fit
Limitations of agency in a corporate context

Concepts: Fit -HITA, and how HITA influences organizational courage
Gestalt - coherence of internal structures
Stratification of Fit: proposes 3 levels of fit Level 1 - Level 2 - Level 3
Actualization - application and implementation
Innovation - 2 types - exploratory - exploitative - exploitative meaning commercializable - actually - it seems both exploratory and exploitative are for commercial applications - exploratory refers to innovating new products - exploitative refers to innovating existing products - exploratory innovation is radical - Exploitative is Incremental. Exploratory innovation is more disruptive.
Actualizing affordances - Requires experimentation, changes, tinkering - these processes can pose a perceived risk that a less courageous organization may be averse to, and therefore will never benefit from affordances that are never implemented or actualized.
Moderation - one variable has an effect on another variable, but that intensity of that impact is affected by a third variable
Mediation - one variable has an effect on another variable, but this effect can only occur through an intermediate variable, or intermediary, that transmits the effect from the first variable, to the second Variable
Profile deviation - expectations vs reality
Matching - two variables

Covariance
Gestalt

Frameworks: Agility - the ability to adapt to changing circumstances
Terminology: Organizational Courage - refers to the ability to take risks -
Fit - Alignment and harmony - FIT & HITA refer to the convergence of IT infrastructure and organizational objectives in a way that serves as a catalyst for innovation - fosters innovation
Circumspect - risk averse - risk avoidance - wary or risk
Transitive Effect -
Salience = prevalence -
Parsimonious - used in this context to mean focused
Spurious - dubious or contrived

Conflicts: Exploratory innovation by a firm may create products that conflict with existing product lines the following are a list of companies that innovated products that conflicted with existing products:
Vanguard - passively managed index funds
State Street - Exchange traded funds
Xerox - GUI, Personal Computers
Polaroid - Digital Cameras, digital photography, digital imaging
Alphabet - Large Language Models
Booking holdings - Vacation Rentals
IBM - Personal Computers , Servers
Altria - vape products
Microsoft - Mobile Operating Systems, Mobile Devices
Corteva - Bioengineered crops
Blockbuster - video streaming services
Palm, blackberry, motorola - touchscreen smartphones
DR Horton, Lennar Greystone - Modular construction techniques
Atari - console gaming - computer gaming - multiplayer gaming
Reflections: Affordances must be actualized, having the best tools, having the best technology means nothing if it isn't put into use, it's useless if it isn't used - and it's useless if it isn't used to produce anything, like to innovate new products, or iterate and improve upon existing products. These new innovations have the potential to create uncertainty and perceived risks to an organization, and an organization must have courage to overcome the fears of risk and uncertainty to actualize technology to innovate.
What the data shows is that the rewards are there for organizations willing to take risks, for organizations that have The organizational courage to take prudent and well calculated risks and address the uncertainties

that come with those, rewards, those innovations, however, in order for these rewards to materialize for an
Organization, information Technology affordances must be actualized in combination with a strong
culture of organizational courage.
There is a point in the article that shows that there is a strong relationship between exploratory and exploitative
innovation, that when one measurement measures high, that the other will also measure high. One thing we
discussed in class was that, a long series of incremental, exploitative innovations, can result in - or can add
up to something similarly to an exploratory, disruptive innovation

3.2: Disruptive Innovations With It

1: Disruptive Innovation: Conceptual Foundations And Research Opportunities
Disruption: The term disruption - Currently Overused - core concepts misunderstood - disruption usually occurs at the
lower-end of the market. Incumbents produce over-developed products. New entrants develop inexpensive
products.
Fintech -
Rideshare -
Vacation Rentals -
Browser software -
The technology isn’t usually innovative, but the business model is what is disruptive
Low-end encroachment - movement from the low-end of the market, upstream, to the higher end of the market is
Usually something incumbents tend not to pay attention to - and this results in an increased chance of
being disrupted
Industry-Wide or Strategic Disruptions
Green Revolution
Automation, AI, robotics, drones
Sensor Technologies, wireless sensor networks
Additive Manufacturing techniques, 3d printing, digital production
Methods: Used language analysis to screen 1078 research papers published between 1978 - 2016
Diffusion patterns
Ex-ante
Ex-post
Post-hoc conclusions
Dynamics: incumbents, established organizations lose ground when innovations occur due to a focus on existing,
sophisticated customers

It has been suggested that organizations develop units that guard against disruptions rather than focus on customer needs
Leadership structures that cause organizations to be disrupted, increase the risk of being disrupted, and have difficulties adapting and reacting to disruptions
Legislative barriers prevented or interfered with the adoption of e-readers in japan - copyrights and intellectual property protections specifically

2: Agility In Responding To Disruptive Digital Innovation

Focus: small and medium sized enterprises - firms

Terminology: SME - small to medium sized enterprises
DDI - disruptive digital innovation
Rigidity & Agility - refers to or connects to the concept of organizational inertia and agility

Cases: Kodak - failure to respond to digital photography
Nokia - failure to respond to smartphones
AirBNB - how will it adapt as the market for vacation rentals becomes increasingly competitive
Uber Technologies -
Elixir Technologies - coding changes - programming disruptions - software delivery distribution disruptions - moved from business reporting - to business intelligence software - then to providing this service through the cloud or through a cloud based application. - Developed a system for dispatching taxis to taxi stands, but this was disrupted by ride-hailing services, so the technology was modified to serve mass transit stations
Elixir was in a somewhat unique position - since they were in a business reporting, business intelligence, business analytics software business, they often had extensive external network relationships since they had to work with a variety of businesses - through these networks, the leadership teams were often more creative, and more open to new business ideas. Converted the transit system software to a smart-transit software system. from off the shelf packages - to cloud based software as a service - from business reporting software to business analytics software. Had to adapt to mobile devices - pdas - and later to smart phones - to allow delivery of the software to mobile devices

Concepts: Agility is the key factor in surviving disruptions caused by digital innovations - requires the ability to detect and

respond to the changes caused by the innovations
Some innovations may require the combination of several different technologies, or may require the maturity of
some technologies to occur, prerequisite developments to take place.
SME - do not require large amounts of slack resources - refers to emergency fund style resources - larger
organizations require more slack resources in a way that someone with higher monthly expenses may require
a larger emergency fund. SMEs tend to have owner/managers who tend to have a mindset or approach that is
different from someone who is an employee/manager
External network relationships - people outside a firm who can assist an SME in various ways, support an SME in
various ways, provide external competencies, external insights, alternative viewpoints, identify
Opportunities
SME - does experience greater resource constraints compared to larger organizations
Organizational Ambidexterity - managing exploratory, and exploitative innovation at the same time.
Exploratory vs Exploitative innovation - in elixer's case - mentioned that 3 out of 10 exploitative pilot projects
work out, compared to 1 out of 10 for exploratory pilot projects
Responding to changes - develop capabilities - preventing rigidities - sensing requires leadership to have strong
external networks boundary openness
Sensing Capabilities - being able to detect changes in innovation that can disrupt a business.
SME - has benefits as well as challenges, they don't require extensive resource slack, or fall back resources, but
they also don't have - this also is an issue because they may not have enough resources to reconfigure the
Business or to adapt in the necessary ways after a disruption.

3: The Disruptive Information Technology Innovation Model
Frameworks: "disruptive information technology innovation model (DITIM)
adoption timing
disruptive innovation cycle
Variables that Differ between early and late adopters
(1) adoption rate of radical IT innovations,
(2) strong order effects on downstream innovations related to the amount of innovation,
(3) perceived radicalness of innovations and
(4) strong effects on downstream innovations related to the radicalness of innovation.

DITIM explains innovation patterns over time and articulates their sequence across three types of IT innovations:
(1) bases
(2) processes
(3) services
Radical Innovations
learning barriers - high during early period of innovation cycle,
lower later on due to larger knowledge base

Timelines: 1995–1999, an early period of rapid, broad and deep industry-wide innovation
2000 - onward, a period in which industry-wide innovation slowed,
became dramatically standardized and posed lower learning requirements
for new entrants relative to the earlier stage.

Conclusions: Goals of
(1) demonstrating the importance of considering temporal factors in the study of disruptive innovation
(2) illustrating that innovation types matter when theorizing about IT-innovation creation and adoption
service innovation: primary engine of process innovation during the entire disruptive IT-innovation cycle
Service innovation drives process innovation
base technologies: 'mature' and become more standardized and powerful, they have more significant effects.
process innovations: take more time to mature and evolve
Process innovations: Process innovations may also have early substitutive effects when the causal links between
the base technologies and their effects are poorly understood and are later replaced with complementary
Effects.
Reflections: There is an early and late innovation cycle
And there are early and late adopters of innovations"

4: The Disruptive Nature Of Information Technology Innovations
"Context: This article deals with or addressed how the internet impacted or had an impact in the United States and Finland.
It was written in 2003, it mentions how the distribution of information shifted away from mainframe
distribution to internet distribution
Disruptive Innovation - structural features distinct from interactive processes
disruptive architectural innovations - deviate radically

from existing architectures - May be appropriations of
latent technologies or adaptations of latent technologies to new user needs

Innovation Diffusion Trajectory”

“In their simplest form, IT innovations involve only a technological component—changes in hardware and software that are new to an industry or adopters—but they are often augmented with complementary organizational innovations including new forms of cognition, meaning, work process, business process, or organizational structure.”

Implications: correct timing in the diffusion of disruptive innovations
Learning curve is often steep
Expertise in multiple areas is extremely rare - dedicated specialists are often required.

Type I system development processes - services
Type II - administrative functions
Type III - core business processes

3.3: Innovating With Artificial Intelligence

1: Artificial Intelligence In Organizations
2: AI Innovation Typology
Different Current Users
used by credit card companies to detect fraud
ai assistants like siri and alexa
medical uses of AI to detect Illnesses

Professionals need to determine if Artificial intelligence will enhance their professions, or serve to undermine and devalue their professions.

Structured Data
this type of data is schematically standardized and organized
inventory figures sales data production levels stock exchange data
unstructured Data
IoT // social media posts // blog posts // reviews // tweets
IoT - the Internet of things - how objects are connected to the Internet

processes
pre-processes
Natural Language Understanding
converts spoken words into text
statistical modeling and machine learning
computer vision

main processes
problem solving
reasoning
Machine Learning
lets AI systems enhance their performance initially allowed
artificial neural networks - consist of a sequence of layers where data is processed
in one layer before being handed off to and processed by a deeper layer.

outputs
natural language generation
image creation
robotics
Technological discontinuities
when a new technology offers so much of an advantage that no increase in efficiencies, scale, or design to existing technologies can compete
this relates back to
exploratory and disruptive innovation
and
exploitative and incremental innovation

autonomous vehicles

competence enhancing

do not change fundamentals, increase and serve as a tool to existing skills.

competence destroying

render existing skills obsolete

Artificial generalized intelligence - strong AI - to simulate human thought

Applied Artificial Intelligence - for tasks that are commercially viable
Artificial super intelligence -

Things to consider

implementation - there is a need for

interoperability between programs - this can be difficult if API's are
not compatible with one another.

Data Quality - the quality of the data used to train AI models could be skewed, Inaccurate, biased, not representative - or poorly defined.

- low quality inputs result in low quality outputs by the AI models.

Privacy Measures - need to be in place to product individuals, large amounts of data are required to train AI models.

3: Artificial Intelligence (AI): Multidisciplinary Perspectives

Two Types or goals
to perform specific tasks
to think like a human

deep neural networks to improve AI, may not improve these tools.
realistic limits of AI, the - it's to serve as a tool, and move up the value chain - while using AI -
the concept of AI replacing humans is a dated concept.

Application domains
The AI literature has identified several separate domains in which the technology can be applied:

Digital Imaging,
Education,
improve teacher effectiveness
tutoring systems
library users
library processes
intelligent narrative technologies
staffing requirements
student engagement
game-based learning environments
Government,
Healthcare,
medical informatics
loopthink - limitation of medical AI-loopthink
type of implicit bias
which does not perform correct reappraisal of information or revision

Weak loopthink refers to the intrinsic inability of computer

intelligence to redirect executive data flow because of its fixed internal
hard writing, un-editable sectors of its operating system, or unalterable
lines of its programme code.
Strong loopthink refers to AI suppression due to internalisation of the ethical framework.

This is interesting - it seems to refer when the AI tool which should train itself in a way that improves itself

Manufacturing,
Robotics and
Supply Chain.

Data Visualizations

Data Challenges
Disagreements about data standards creates challenges
a cardiac imaging - there were - there was a need to standardize data across institutions
issues about transparency and reliability
interpretations of imagery proved to be an obstacle
the dimensionality obstacle

Social Challenges
Unrealistic expectations
not
fear of job losses
fear of loss of participation in society

Human cognitive flexibility
the ability to interpret unstructured data

SME - Society of Manufacturing Engineers
Small and midsize enterprises (SMEs)
are businesses that have revenues, assets, or a number of employees below a certain
threshold. Each country has its own definition of what constitutes a small and midsize enterprise.
- investopedia (2024)

Critically, in subsets of these components, the data science may be handled independently,

for example by
product or cloud suppliers, with different
viewpoints. So the following question arises: how can the inferences

delivered by different AI components be

integrated coherently when they may
be based on
different data, and subject to
different ecosystem conventions
(and the associated
quality differences) (Walton, 2018a; Walton, 2018b)?

This question can be retitled as the discrimination problem

one of the earliest uses of AI was
the chess game computer

different levels of automation are appropriate for different types of tasks
manual
autonomous

how much is given to a human, how much and what kind of input a human user gives to the machine

situational awareness
there is an expectation that there will be increasing issues with situational
awareness because humans don't have the same level of alertness or cognizance of events
that they themselves do not create - whether that change is made by an AI, or another human,
so as more things become automated, and more changes are made - or more actions are made by machines
situational awareness is expected to decrease.

Logistics

Amazon

Uber

Value of AI should be highest when it reaches maturity - unlikely to be commoditized - meaning standardized product or indistinguishable from other AI products.

consumer preferences
can make or assist in providing customers with more
more validated purchasing decisions. frequency of marketing messages
automated bidding on marketing Artifacts
advertising - machines generate content - consumers feel like they are being targeted

people are afraid of AI that they don't really have a full understanding of

I can't believe how long this article is. it's taking forever to get through.

Marketing Implications

Assists in designing better marketing material
allows advertisers to better understand the data
sales teams to meet their sales targets and goals

AI resulted in reduced production rate at AirBus

"For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air
Bus."

"A production rate is a quantity of production accomplished over a specific period of time and
realistic production rates are the key in determining reasonable contract times for construction projects."

"In manufacturing, production rate is typically measured as the quantity of goods manufactured per hour, day, week, month, or any other relevant time frame."

"For example, let's say that workers at a manufacturing plant can produce 5,000 units per week using 50 hours of labor. As a result,
the production rate per hour would be 100 units (5,000 / 50 hours) minus any defective units. The 100 unit per hour
production rate could be used as a baseline number for comparative purposes. "

"In a wide range of areas AI can be deployed (please see for a recent
review, Duan et al., 2019). For instance, Ransbotham, Kiron, Gerbert,
and Reeves (2017) highlights that AI reduced the production rate in Air"

"Ransbotham, S., Kiron, D., Gerbert, P., & Reeves, M. (2017). Reshaping business with
artificial intelligence: Closing the gap between ambition and action. MIT Sloan
Management Review, 59(1)."
"Gerbert, P., Reeves, M., Ransbotham, S., Kiron, D., & Spira, M. (2018). Global

competition with AI in business: How China differs. MIT Sloan Management Review
(July)."

Legal and Regulatory Implications

how to determine liability and accountability issues.

fake news and misleading information

Human Rights implications
the right not to be measured
not to participate or be used to train the AI models in question

Government Adoption of AI tools and applications
efficiencies
public hospitals using analytics tools to determine outbreaks
algorithmic opacity - when it's not known, or disclosed how a system works.
public opinion formation through tools like social media
influences public policy directions

Smart Cities and development of
better city design

Social Science Implications

Digital haves and have-nots

disrupts can create new social paradigms
exposes people lower on the social rung to exploitation

Digital inequity, and digital divide

profiling and law enforcement issues. biases may be reinforced

Keeping Humans at the center of the design

Ethical implications of artificual Intelligence have
not been fully contemplated and established

I really can't believe how long this article is. I've been listening

to this for I even don't how many
hours. Lord.

Reinforcement Learning
Referenced during GPT 2 development and Meta chat-bot experiments
can have unpredictable results

Deep Max Scores

Framework

Blockchain and Artificial Intelligence

- Reading Completed on 06:47 AM on 03/06/2024

I want to say that the reading took a full 7 hours.

3.1 Leveraging large language models for predictive chemistry

Terminology: Machine Learning
Large Language Model
LLM Training
In context learning - this refers to how the LLM learns about a subject during the course
of a chat session, rather than fine-tuning or training the model directly.
Inverse design - this refers to creating molecular structures - or chemicals - polymers or alloys - that react in a certain way, or have a specific set of properties - I think that it is called inverse design because, rather than creating a chemical, and describing its properties, - the desired properties are described, and then the molecule is designed
Generative Models
MLM - Machine Learning Model
LLM - Large Language Model
First-principles theory
Isomers - This is chemistry related
Polymers- This is chemistry related
Monomers - This is chemistry related
Gaussian process regression - GPR

Generative pretrained transformer - gpt

Applications: Large Language Models and machine learning to chemistry, and physical sciences
Computing, programming, AI, ML, LLM on Physical sciences, chemistry, and predictive
Simulations
Generating a specific type of dispersant - which I think is a kind of soap - generating a
dispersant with a specific set of characteristics

Limitations: The LLM was able to generate molecules using inverse design, or, it was able to
Hypothesize the existence of chemicals with a desired set of characteristics,
But there were instances where the LLM generated invalid chemical structures
Even if an LLM is able to generate a new chemical, that chemical still has to be synthesized
And there are instances where it's not really possible or practical to synthesize the
Chemical generated by the LLM
It can be difficult to train an LLM accurately, or train it well for accuracy because very
large dataset are required, and there are limitations on how many chemicals can be tested and added to a given data set to train an LLM on

Variations: Using a general LLM AI tool (GPT 3) trained on chemistry documents Rather than a
chemistry specific AI tool, or existing chemistry simulation tools conventional machine learning models designed for chemistry
Existing machine learning models represent chemicals or molecular structures
mathematically, or symbolically, or as a kind of code or program that reacts

a certain way, rather than verbally. Existing machine learning models simulate molecular structures in an abstract way, rather than verbally, the approach used in this paper, by these researchers, describes chemicals verbally
The GPT 3 LLM was compared with a gaussian process regression mlm

Reflections: this was a really interesting article - one of the things that I'm wondering is: if copyright
protection isn't or cannot be granted to ai generated text or ai generated artwork, will patents also not be granted to ai generated chemicals? Or AI generated medicines or Pharmaceuticals? Or ai generated chemical compounds.
AI is already used to create novel chemical structures, however, the prevailing AI tools
used for the purpose of generating novel chemical structures are Machine learning models, rather than large language models, this research paper approaches generating novel chemical structures using LLMs rather than MLMs

Intersections: This paper illustrates the concept of IT Affordances - LLMs have

certain capabilities, and
how LLMs are appropriated, in this case, an LLM is appropriated for the purpose of creating novel chemical compounds - this article illustrates a novel appropriation of an existing tool.

4: Strategic Use Of AI
Analytical tools for business strategy
used a tool to review customer reviews on Yelp and similar websites and drafted a business strategy or business proposals

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Annotations

Testing the presentation - tested inserting videos - creating charts - creating diagrams -

Created slides 21 - 24 - subsequently deleted.

Updated Module paper 3, just the references page

I came across an interesting scholarly article that I want to read, and cite in this

paper
So i am skipping to 3.3 of the module 3 paper

Article Read Aloud Set up Area

– this was basically useless, you can’t print a pdf that has read aloud enabled, a document has to be downloaded, not printed – as a pdf in order for it to be read aloud enabled

...

Module 1
Vicky
Module 2
Kelly
Module 3
Kenneth
Module 4
Group Paper
4.1. The Landscape of Emerging Technologies
Vicky
4.1.1 Blockchain Research in Information Systems Vicky
4.1.2 Editorial Emergent Tech and Organizing Vicky
4.1.3 the Fintech Revolution:
Vicky
4.1.4 Quantum Computing and Information Systems Vicky

4.2. The Changing Nature of Work
Kelly
4.2.1 Editorial Future of Work Organizations Society Kelly
4.2.2 Human Factors in AI and Future of Work Kelly
4.2.3 Mental Health and Information Technology Kelly
4.2.4 Waging war from remote cubicles
Kelly

4.3 Digitalization: Advances and Challenges Kenneth
Group Presentation
4.3.1 Digital Innovation Review
Kenneth Vicky
4.3.2 Unpacking The Difference
Kenneth Kelly
4.3.3 Digital Opportunities For Incumbents
Kenneth Kenneth
4.3.4 Digitalization Ethical Challenge
Kenneth Kenneth

...

Integrative Conceptual Summary

The Relation Between It And Organizational Innovation

In the article The Nonlinear Influence Of Harmonious Information Technology (Chatterjee et al., 2021) the author puts forward the idea that the relationship between HITA and Innovation is U-shaped, meaning that increased innovation is a result of increased HITA, but increased innovation can also be a result of decreased HITA. It’s intuitive enough that increased innovation results from increased HITA, everyone works well when everything works well, but the counterintuitive aspect of Chatterjee’s hypothesis is that increased innovation can also result when HITA is decreased, out of the chaos: innovation. In chaotic and creatively dissonant environments, a need arises to develop mechanisms that tie different operational units together. A general example of this would be something like the creation of the Euro to deal with the myriad currencies that existed in the EU trade bloc before the invention of the Euro, on the other hand, there isn’t enough dissonance between North American countries to drive or warrant such a currency innovation for the USMCA trade bloc.

In The Strategic Relevance Of Organizational Virtues Enabled By IT (Chatterjee et al., 2015) the author puts forward a framework for business ethics based on virtues that contrasts with conventional business ethics frameworks based on morality as well as business ethics frameworks based on optimization. Courage, justice, wisdom, and temperance are the virtues that Chatterjee bases the virtue based business ethics framework upon. Chatterjee extends upon this framework in two directions: the first is to determine how specific elements of HITA drive specific organizational virtues, the second is to determine how these organizational virtues drive innovation. Chatterjee goes on to posit that improvised solutions precede innovation, that innovations are a result of necessity, as well as a need for a temporary solution to that unexpected necessity. Chatterjee found that high levels of Organization Wisdom guide the improvisation and innovation process with the greatest level of success and that the HITA elements of collaboration and memory enable that virtue with the greatest levels of economy. An interesting example of this would be the East Palestine, Ohio train derailment incident involving Norfolk Southern, as well as other high-profile safety issues involving the Boeing Max 737, various news reports mentioned that they had systems in place to detect and document safety issues and quality issues, but would either ignore or disregard those issues. Both of these examples will continue to play out, but either engineering innovations will reduce the costs of resolving safety issues, or legislative innovations will occur that increase the costs of unsafely operating these businesses.

The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021)

...

This is already feeling like it's too long. I'm thinking that I'll just continue writing, and
cut whatever I need to later.

...

I'm frustrated right now. Not a single thing is going right for me right now. and yet, this is how it's always been. it is as if the universe itself was designed to frustrated me.

...

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In The Role Of IT In Organizational Innovation (Mamonov & Peterson 2021) the authors outline a number of different metrics used to measure information technology, and a number of different metrics for measuring innovation. Information technology can be measured with metrics like computing capacity, digital storage capacity, server capacity, data transfer rates, latency. Innovation is often measured by the number of patents filed, or the number of research papers published. This is important because information technology and innovation can seem amorphous and conceptual, but by creating metrics for measuring information technology and measuring innovation, these concepts become concrete and measuring impact and returns on IT investments can be determined. An article was recently published about the Wi-Fi connectivity issues at the Alphabet, Inc. campus where the Gemini AI project is being worked on (Bensinger 2024), it would be interesting to see how this plays out, and if something as simple as Wi-Fi connectivity can result in Google pulling out of the AI race. There have been a number of different instances where companies have pulled back from one venture or another, Apple recently canceled it’s autonomous electric vehicle project (Gurman 2024), similar examples include Google pulling out of social media, Amazon canceling it’s smartphone, Microsoft canceling it’s music player, and it would be interesting if these project cancellations, all of which would have been wonderful innovations, all originally started with simple IT problems like Wi-Fi connectivity issues.

...

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The article Information Technology and organizational innovation: Harmonious information technology affordance and courage-based actualization (Chatterjee et al., 2019) goes over how the capabilities offered by an information technology tool can be affected by attitudes toward using the technology: high levels of organizational courage on one end of the spectrum, and high levels of risk aversion on the other.

...

life is always kicking my ass. never. ceases. to be kicking my ass.

...

```
// everything always takes twice as long as I anticipate it will.
//
//
//
// // for (double value : pointScaleTimesCreditHoursArray) {
// // sumPointScaleTimesCreditHours += value;
//
// // for (double value : packageShippingChargeArray) {
// // packageShippingChargeArray += value;
//
// // double preliminaryCost = 0.00;
// // for (double value : packageShippingChargeArray) {
// // preliminaryCost += value; //
// // }
// // i eliminated preliminaryCost and replaced it with theGrandTotal
//
// // double thePreliminaryGrandTotal = shipment.getThePreliminaryGrandTotal();
// // private double thePreliminaryGrandTotal
// // System.out.println(reset+"The preliminary cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to: "+ green+
// formatDoubleDollars.format(thePreliminaryGrandTotal) +" USD"+reset); //
// getTheGrandTotal()// v// "British Euro Dollars");
// // START - turned out to be a huge waste of time
// // shipment.setThePreliminaryGrandTotal(thePreliminaryGrandTotal);
// // String tFsIn = shipment.getTheFrequentShipperIdentificationNumber();
// // double frequentShipperDiscount = shipment.THE_FREQUENT_SHIPPER_DISCOUNT;
// // double theBulkDiscountAmount = shipment.THE_BULK_PACKAGE_DISCOUNT;
// /*
// if (Integer.parseInt(tFsIn) !=0 &&
// (thePreliminaryGrandTotal-(thePreliminaryGrandTotal *
// frequentShipperDiscount)) <= 300) {
//
// System.out.println(reset+"The preliminary cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to: "+ green+
// formatDoubleDollars.format(thePreliminaryGrandTotal) +" USD"+reset);
// System.out.println(reset+"You will be receiving a frequent shipper discount
// in the amount of: "+ green+
// formatDoubleDollars.format((frequentShipperDiscount *
// thePreliminaryGrandTotal)) +" USD"+reset);
// System.out.println(reset+" "+reset);
// double theFinalGrandTotalAggregateShipmentExpenses =
// shipment.getTheGrandTotal();
// System.out.println(reset+"The total final cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to a Grand Total of:
// "+ green+
// formatDoubleDollars.format(theFinalGrandTotalAggregateShipmentExpenses) +"
// USD"+reset);
// System.out.println(reset+" "+reset);
```

```
//
// } else if (Integer.parseInt(tFsIn) !=0 &&
// (thePreliminaryGrandTotal-(thePreliminaryGrandTotal *
// frequentShipperDiscount)) >= 300) {
// System.out.println(reset+"The preliminary cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to: "+ green+
// formatDoubleDollars.format(thePreliminaryGrandTotal) +" USD"+reset);
// System.out.println(reset+"You will be receiving a frequent shipper discount
// in the amount of: "+ green+
// formatDoubleDollars.format((frequentShipperDiscount *
// thePreliminaryGrandTotal)) +" USD"+reset);
// System.out.println(reset+"You will also be receiving a frequent shipper bulk
// shipment discount in the amount of: "+ green+ (theBulkDiscountAmount) +"
// USD"+reset);
// System.out.println(reset+" "+reset);
// double theFinalGrandTotalAggregateShipmentExpenses =
// shipment.getTheGrandTotal();
// System.out.println(reset+"The total final cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to a Grand Total of:
// "+ green+
// formatDoubleDollars.format(theFinalGrandTotalAggregateShipmentExpenses) +"
// USD"+reset);
// System.out.println(reset+" "+reset);
//
// } else {
// System.out.println(reset+" "+reset);
// double theFinalGrandTotalAggregateShipmentExpenses =
// shipment.getTheGrandTotal();
// System.out.println(reset+"The total final cost of shipping your "+
// packageShippingChargeArray.size() + " package(s) amounts to a Grand Total of:
// "+ green+
// formatDoubleDollars.format(theFinalGrandTotalAggregateShipmentExpenses) +"
// USD"+reset);
// System.out.println(reset+" "+reset);
// }
// */
// // END - turned out to be a huge waste of time
// // START - Let's see if this works
// // I found it this thing was annoying the hell out of me. //
// System.out.print(shipment.getTheGrandTotal());

// System.out.println(reset+(thePreliminaryGrandTotal-(thePreliminaryGrandTotal
// * frequentShipperDiscount))+reset); // for testing

// Integer.parseInt(tFsIn) !=0 && // } else if (Integer.parseInt(tFsIn) !=0 &&
// (thePreliminaryGrandTotal-(thePreliminaryGrandTotal *
// frequentShipperDiscount)) >= 300) {

// THE_FREQUENT_SHIPPER_DISCOUNT * thePreliminaryGrandTotal
// [0mThe preliminary cost of shipping your 1 package(s) amounts to:
```

```
// [32m[1m3.12 USD
// this pushes the preliminary cost of the transaction into the Shipment.java
// but this is actually wrong, so i actually have to do this in the Shipment
// class.
// it's a simple move, but i'm already tired of this.

// British Eurodollars // this is actually supposed to be extremely funny!
// because, at first is seems wrong, the British don't use euro(s), or dollars,
// but British Eurodollars are real, like, they're US dollars held in bank in
// London, or something.
// but yeah, that's supposed to be really funny.

// this alone took forever. the preliminary cost.
// this is taking forever. not only. am not going to get anything higher than a
// C, - what a nightmare.

// I really just want to put the discounts here, but they have to go. inside the
// shipment class. - this is a nightmare -

//
//

// I think that this is where I would put it.
// packageWidth = parcelPackage.getPackageWidth();

// System.out.println(packageShippingChargeArray); // ArrayList<Double>
// packageShippingChargeArray = new ArrayList<Double>();

// I'm starting to understand what object oriented design is
//
// it's like this - the demo class is like an HTML page, and the model class is
// like the JavaScript file.
// when I was starting this assignment, I started with the demo class, because
// like an HTML page, it's
// something I can see. and it's something I can interact with.

// I'm trying to think. I think that the package class is done, but I need
// something to happen once this while loop ends. or.
// I think that it just goes after the end of the while loop, so once a person
// enters N, then the next part of the program starts.
// this is almost done.
// System.out.println(packageShippingChargeArray);
// /*
//
//
// System.out.print("Please enter your frequent shipper identification number:"
// + green);
// packageWeight = Math.ceil(parcelPackage.keyboard.nextDouble()); // Math.ceil(
// parcelPackage.setPackageWeight(packageWeight);
//
```

```
//

//
// "However, each package should not exceed 120 pounds (actual weight) and 100
// outside linear inches (length plus width plus height)."  - Han-fen Hu, Ph.D
//
// "Overweight or over-sized packages are not accepted."  - Han-fen Hu, Ph.D
//
// "If the user enters a zero or a negative number, the program should show an
// error message and request input again until a positive number is entered."  -
Han-fen Hu, Ph.D
//
//
//
// "For the actual weight, any fraction of the measurement should be increased to
// the nearest whole number (for example, 20.1 will be considered 21)."  - Han-fen
Hu, Ph.D
//
// "For each package that can be shipped, the dimensional weight should be
// calculated. Dimensional weight reflects the amount of space a package
// occupies; dimensional weight is calculated by the following steps: (1)
// Determine the package dimensions in inches. For each dimension, any fraction
// of the measurement should be increased to the nearest whole number (for
// example, 1.3 will be considered 2). (2) Multiply the package length by the
// width by the height. The result is the cubic size in inches. (3) Divide the
// cubic size in inches by 166 to determine dimensional weight in pounds. (4)
// Increase any fraction to the next whole pound."  - Han-fen Hu, Ph.D
//
// "The shipping cost of each package is calculated by comparing the actual
// weight to the dimensional weight. The greater of the two is the billable
// weight and should be used to calculate the rate. The final cost of the
// shipment is calculated by multiplying the price per pound ($3.12) by the
// billable weight."  - Han-fen Hu, Ph.D
//
// "For each accepted package, the program should show the actual weight,
// calculated dimensional weight, and the shipping cost for the package."  - Han-fen
Hu, Ph.D
//
// After all the packages are entered, the program will prompt the users to
// enter if they have “frequent-shipper” numbers; if so, a 5% discount will be
// applied to the shipping cost. If the total amount after the frequent-shipper
// discount is greater than $300, an additional “bulk package” discount of $20
// off would be applied. The program shows the total number of packages to ship,
// subtotal before discount, frequent-shipper discount if applied, bulk package
// discount if applied, and the grand total. -  - "Han-fen Hu, Ph.D
//
// "Please use the object-oriented approach to design the program. Specifically,
// a Package class and a Shipment class should be designed and implemented. The
// Package class represents the data and behavior for each individual package.
// The Shipment class represents the entire transaction made by a user."  - Han-fen
```

```
Hu, Ph.D
//
//
//
// */
//
//
// /*
// [0m[31mGreetings: [0m Utilize this terminal to determine the cost to ship
// your parcel.
// Please enter the[31m weight[0m and the [31mdimensions [0mof your parcel:
//
// [0m Data for Parcel # 1
//
// Please enter the[31m weight [0mof your parcel: [32m50
// [0mPlease enter the[31m length [0mof your parcel: [32m50
// [0mPlease enter the[31m width [0m of your parcel: [32m50
// [0mPlease enter the[31m height [0mof your parcel: [32m50
//
// [0mThe parcel has an actual weight of: PLACEHOLDER
// [0mThe parcel has a dimensional weight of: PLACEHOLDER
// [0mThe parcel has the following dimensions: PLACEHOLDER
// [0mThe parcel has a shipping cost of: PLACEHOLDER
//
// [0mWill you be shipping any additional parcels? (Y/N): [32my
//
// [0m Data for Parcel # 2
//
// Please enter the[31m weight [0mof your parcel: [32m50
// [0mPlease enter the[31m length [0mof your parcel: [32m50
// [0mPlease enter the[31m width [0m of your parcel: [32m50
// [0mPlease enter the[31m height [0mof your parcel: [32m50
//
// [0mThe parcel has an actual weight of: PLACEHOLDER
// [0mThe parcel has a dimensional weight of: PLACEHOLDER
// [0mThe parcel has the following dimensions: PLACEHOLDER
// [0mThe parcel has a shipping cost of: PLACEHOLDER
//
// [0mWill you be shipping any additional parcels? (Y/N): [32my
//
// [0m Data for Parcel # 3
//
// Please enter the[31m weight [0mof your parcel: [32m50
// [0mPlease enter the[31m length [0mof your parcel: [32m50
// [0mPlease enter the[31m width [0m of your parcel: [32m50
// [0mPlease enter the[31m height [0mof your parcel: [32m50
//
// [0mThe parcel has an actual weight of: PLACEHOLDER
// [0mThe parcel has a dimensional weight of: PLACEHOLDER
// [0mThe parcel has the following dimensions: PLACEHOLDER
```

```
// [0mThe parcel has a shipping cost of: PLACEHOLDER
//
// [0mWill you be shipping any additional parcels? (Y/N): [32my
//
// [0m Data for Parcel # 4
//
// Please enter the[31m weight [0mof your parcel: [32m50
// [0mPlease enter the[31m length [0mof your parcel: [32m50
// [0mPlease enter the[31m width [0m of your parcel: [32m50
// [0mPlease enter the[31m height [0mof your parcel: [32m50
//
// [0mThe parcel has an actual weight of: PLACEHOLDER
// [0mThe parcel has a dimensional weight of: PLACEHOLDER
// [0mThe parcel has the following dimensions: PLACEHOLDER
// [0mThe parcel has a shipping cost of: PLACEHOLDER
//
// [0mWill you be shipping any additional parcels? (Y/N): [32my
//
// [0m Data for Parcel # 5
//
// Please enter the[31m weight [0mof your parcel: [32m50
// [0mPlease enter the[31m length [0mof your parcel: [32m50
// [0mPlease enter the[31m width [0m of your parcel: [32m50
// [0mPlease enter the[31m height [0mof your parcel: [32m50
//
// [0mThe parcel has an actual weight of: PLACEHOLDER
// [0mThe parcel has a dimensional weight of: PLACEHOLDER
// [0mThe parcel has the following dimensions: PLACEHOLDER
// [0mThe parcel has a shipping cost of: PLACEHOLDER
//
// [0mWill you be shipping any additional parcels? (Y/N): [32my
//
// [0m Data for Parcel # 6
//
// Please enter the[31m weight [0mof your parcel: [32mchickens
// Exception in thread "main" java.util.InputMismatchException
// at java.base/java.util.Scanner.throwFor(Scanner.java:947)
// at java.base/java.util.Scanner.next(Scanner.java:1602)
// at java.base/java.util.Scanner.nextDouble(Scanner.java:2573)
// at
//
edu.unlv.mis768.kly.individualassignment3.ShippingCalculatorDemo.main(ShippingCalcul
atorDemo.java:44)
// */
//
// //Please enter the file name where you would like to print your transcript:
// D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\
// unlv\mis768\kly\individualassignment2\transcript02292024.txt
// //Data has been written to D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\
// unlv\mis768\kly\individualassignment2\transcript02292024.txt successfully.
```

```
// //
// //Enter a course number for entry # 1: Advanced Studies in Chickens 101
// //Enter credit hours for entry # 1: 3
// //Enter letter grade earned for entry # 1: a
// //Do you have additional course details to enter? (Y/N): y
// //Enter a course number for entry # 2: advanced studies in geese 102
// //Enter credit hours for entry # 2: 3
// //Enter letter grade earned for entry # 2: a
// //Do you have additional course details to enter? (Y/N): y
// //Enter a course number for entry # 3: intermediate duck related conspiracy
// theories 103
// //Enter credit hours for entry # 3: a
// //Exception in thread "main" java.util.InputMismatchException
// // at java.base/java.util.Scanner.throwFor(Scanner.java:947)
// // at java.base/java.util.Scanner.next(Scanner.java:1602)
// // at java.base/java.util.Scanner.nextInt(Scanner.java:2267)
// // at java.base/java.util.Scanner.nextInt(Scanner.java:2221)
// // at
//
edu.unlv.mis768.kly.individualassignment2.CreateTranscriptDemo.main(CreateTranscript
Demo.java:59)
// //
// //
// // Enter a course number for entry # 1: Advanced Studies in Chickens 232
// //Enter credit hours for entry # 1: 4
// //Enter letter grade earned for entry # 1: a
// //Do you have additional course details to enter? (Y/N): y
// //Enter a course number for entry # 2: Advanced Studies in Orange Juice 443
// //Enter credit hours for entry # 2: 3.5
// //Exception in thread "main" java.util.InputMismatchException
// // at java.base/java.util.Scanner.throwFor(Scanner.java:947)
// // at java.base/java.util.Scanner.next(Scanner.java:1602)
// // at java.base/java.util.Scanner.nextInt(Scanner.java:2267)
// // at java.base/java.util.Scanner.nextInt(Scanner.java:2221)
// // at
//
edu.unlv.mis768.kly.individualassignment2.CreateTranscriptDemo.main(CreateTranscript
Demo.java:59)
// //
// //
// // String red = "\u001B[31m";
// // String reset = "\u001B[0m";
// //
// // ANSI escape codes
// //
// // String black = "\u001B[30m";
// // String red = "\u001B[31m";
// // String green = "\u001B[32m";
// // String reset = "\u001B[0m";
// //
```

```
// // Black: \u001B[30m
// // Red: \u001B[31m
// // Green: \u001B[32m
// // Yellow: \u001B[33m
// // Blue: \u001B[34m
// // Magenta: \u001B[35m
// // Cyan: \u001B[36m
// // White: \u001B[37m
//
// //System.out.println("[31mGreetings: [0m Utilize this terminal to determine
// the shipping costs of your parcel.");
// /*
// Nectar
// Enter a course number for entry # 1: Orange Juice 232
// Enter credit hours for entry # 1: 3
// Enter letter grade earned for entry # 1: a
// Do you have additional course details to enter? (Y/N): y
// Enter a course number for entry # 2: Lemonade 443
// Enter credit hours for entry # 2: 3
// Enter letter grade earned for entry # 2: a
// Do you have additional course details to enter? (Y/N): y
// Enter a course number for entry # 3: Milk 868
// Enter credit hours for entry # 3: 3
// Enter letter grade earned for entry # 3: c
// Do you have additional course details to enter? (Y/N): y
// Enter a course number for entry # 4: Nectar
// Enter credit hours for entry # 4: 3
// Enter letter grade earned for entry # 4: a
// Do you have additional course details to enter? (Y/N): n
// Grade Point Average: 3.50
// Would you like to printout of your transcript? (Y/N): y
//
//
//
//
// */
// // public class ShippingCalculatorDemo {
// // The name of a class should be a noun/noun-phrase.
// // I'm frustrated right now. everything is a disaster, and nothing is going
// right.'
// // and I don't anticipate things getting better. this is a nightmare.'
//
//
// /*
// "Dimensional weight, also known as volumetric weight, is a pricing technique
// used
// by postal services and commercial freight companies. It's based on the cubic
// capacity
// of a package, rather than its weight.""
// */
```

```
// I'm really stressed out right now. such a nightmare - I filed a software
copyright for the computer program for
// individual assignment # 3.

// here is one of the major challenges I'm facing right now.
// I won't get any credit for turning in a group project because I would have to be
part of a group
// in order to receive any credit for doing a group project. and it's due. later
today. this is a nightmare.

// I don't know what to do - life is such a nightmare
// a real nightmare.
// a headache beyond anything anyone can imagine.

// there is a strong chance that I will have to audit this course MIS 768 // and
// that's a nightmare // and a disappointment
// a real disappointment for me.

/*
 * Microsoft Windows [Version 10.0.22631.3155]
(c) Microsoft Corporation. All rights reserved.

C:\Users\KLYam>javac
Usage: javac <options> <source files>
where possible options include:
  @<filename>                  Read options and filenames from file
  -Akey[=value]                Options to pass to annotation processors
  --add-modules <module>(,<module>)*
        Root modules to resolve in addition to the initial modules,
        or all modules on the module path if <module> is ALL-MODULE-PATH.
  --boot-class-path <path>, -bootclasspath <path>
        Override location of bootstrap class files
  --class-path <path>, -classpath <path>, -cp <path>
        Specify where to find user class files and annotation processors
  -d <directory>               Specify where to place generated class files
  -deprecation
        Output source locations where deprecated APIs are used
  --enable-preview
        Enable preview language features.
        To be used in conjunction with either -source or --release.
  -encoding <encoding>         Specify character encoding used by source files
  -endorseddirs <dirs>         Override location of endorsed standards path
  -extdirs <dirs>              Override location of installed extensions
  -g                           Generate all debugging info
  -g:{lines,vars,source}       Generate only some debugging info
  -g:none                      Generate no debugging info
  -h <directory>
        Specify where to place generated native header files
  --help, -help, -?            Print this help message
```

```
--help-extra, -X             Print help on extra options
-implicit:{none,class}
      Specify whether to generate class files for implicitly referenced files
-J<flag>                     Pass <flag> directly to the runtime system
--limit-modules <module>(,<module>)*
      Limit the universe of observable modules
--module <module>(,<module>)*, -m <module>(,<module>)*
      Compile only the specified module(s), check timestamps
--module-path <path>, -p <path>
      Specify where to find application modules
--module-source-path <module-source-path>
      Specify where to find input source files for multiple modules
--module-version <version>
      Specify version of modules that are being compiled
-nowarn                      Generate no warnings
-parameters
      Generate metadata for reflection on method parameters
-proc:{none,only,full}
      Control whether annotation processing and/or compilation is done.
-processor <class1>[,<class2>,<class3>...]
      Names of the annotation processors to run;
      bypasses default discovery process
--processor-module-path <path>
      Specify a module path where to find annotation processors
--processor-path <path>, -processorpath <path>
      Specify where to find annotation processors
-profile <profile>
      Check that API used is available in the specified profile.
      This option is deprecated and may be removed in a future release.
--release <release>
      Compile for the specified Java SE release.
      Supported releases:
          8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
-s <directory>               Specify where to place generated source files
--source <release>, -source <release>
      Provide source compatibility with the specified Java SE release.
      Supported releases:
          8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
--source-path <path>, -sourcepath <path>
      Specify where to find input source files
--system <jdk>|none          Override location of system modules
--target <release>, -target <release>
      Generate class files suitable for the specified Java SE release.
      Supported releases:
          8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21
--upgrade-module-path <path>
      Override location of upgradeable modules
-verbose                     Output messages about what the compiler is doing
--version, -version          Version information
-Werror                      Terminate compilation if warnings occur
```

```
C:\Users\KLYam>java
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:48: error: cannot find symbol
                Shipment shipment = new Shipment(billableWeight);
                ^
  symbol:   class Shipment
  location: class ParcelTerminalDemo
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:48: error: cannot find symbol
                Shipment shipment = new Shipment(billableWeight);
                                        ^
  symbol:   class Shipment
  location: class ParcelTerminalDemo
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:96: error: no suitable constructor found for
Package(double,double,double,double)
                        Package parcelPackage = new Package(packageWeight,
packageLength, packageWidth, packageHeight);
                                                ^
    constructor
Package.Package(String,String,String,String,String,String,String,URL,ClassLoader) is
not applicable
      (actual and formal argument lists differ in length)
    constructor Package.Package(String,Module) is not applicable
      (actual and formal argument lists differ in length)
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:171: error: cannot find symbol
                                packageWeight =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:175: error: cannot find symbol
                                parcelPackage.setPackageWeight(packageWeight);
                                             ^
  symbol:   method setPackageWeight(double)
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:177: error: cannot find symbol
                                packageWeight = parcelPackage.getPackageWeight();
                                                             ^
  symbol:   method getPackageWeight()
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:233: error: cannot find symbol
```

```
                                packageLength =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:234: error: cannot find symbol
                                parcelPackage.setPackageLength(packageLength);
                                             ^
  symbol:   method setPackageLength(double)
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:238: error: cannot find symbol
                                packageLength = parcelPackage.getPackageLength();
                                                             ^
  symbol:   method getPackageLength()
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:350: error: cannot find symbol
                                packageWidth =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:351: error: cannot find symbol
                                parcelPackage.setPackageWidth(packageWidth);
                                             ^
  symbol:   method setPackageWidth(double)
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:353: error: cannot find symbol
                                packageWidth = parcelPackage.getPackageWidth(); //
packageWidth + packageHeight
                                                             ^
  symbol:   method getPackageWidth()
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:418: error: cannot find symbol
                                packageHeight =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:419: error: cannot find symbol
                                parcelPackage.setPackageHeight(packageHeight);
                                             ^
  symbol:   method setPackageHeight(double)
  location: variable parcelPackage of type Package
```

```
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do\ParcelTerminalDemo.java:421: error: cannot find symbol
                                packageHeight = parcelPackage.getPackageHeight();
                                                             ^
  symbol:   method getPackageHeight()
  location: variable parcelPackage of type Package
15 errors
error: compilation failed

C:\Users\KLYam>D:

D:\>cd GitHub

D:\GitHub>cd MIS76810032024Sprg

D:\GitHub\MIS76810032024Sprg>cd src

D:\GitHub\MIS76810032024Sprg\src>cd MIS768

D:\GitHub\MIS76810032024Sprg\src\MIS768>cd edu

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu>cd unlv

// D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\ unlv>cd mis768

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\ unlv\mis768>cd kly

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly>cd individualassignment3

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3>cd
redo

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>ParcelTerminalDemo.java

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
ParcelTerminalDemo.java

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
javac ParcelTerminalDemo.java
ParcelTerminalDemo.java:20: error: illegal unicode escape
D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
```

```
do\ParcelTerminalDemo.java
                                                    ^
1 error

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\\unlv\mis768\kly\individualassignment
3\redo\ParcelTerminalDemo.java

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
D:

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd GitHub
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd MIS76810032024Sprg
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd src
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd MIS768
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd edu
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd unlv
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd mis768
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd kly
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd individualassignment3
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>cd redo
```

```
The system cannot find the path specified.

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>java ParcelTerminalDemo.java
ParcelTerminalDemo.java:50: error: cannot find symbol
                Shipment shipment = new Shipment(billableWeight);
                ^
  symbol:   class Shipment
  location: class ParcelTerminalDemo
ParcelTerminalDemo.java:50: error: cannot find symbol
                Shipment shipment = new Shipment(billableWeight);
                                        ^
  symbol:   class Shipment
  location: class ParcelTerminalDemo
ParcelTerminalDemo.java:98: error: no suitable constructor found for
Package(double,double,double,double)
                        Package parcelPackage = new Package(packageWeight,
packageLength, packageWidth, packageHeight);
                                                ^
    constructor
Package.Package(String,String,String,String,String,String,String,URL,ClassLoader) is
not applicable
      (actual and formal argument lists differ in length)
    constructor Package.Package(String,Module) is not applicable
      (actual and formal argument lists differ in length)
ParcelTerminalDemo.java:173: error: cannot find symbol
                                packageWeight =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:177: error: cannot find symbol
                                parcelPackage.setPackageWeight(packageWeight);
                                              ^
  symbol:   method setPackageWeight(double)
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:179: error: cannot find symbol
                                packageWeight = parcelPackage.getPackageWeight();
                                                              ^
  symbol:   method getPackageWeight()
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:235: error: cannot find symbol
                                packageLength =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:236: error: cannot find symbol
                                parcelPackage.setPackageLength(packageLength);
                                              ^
```

```
  symbol:   method setPackageLength(double)
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:240: error: cannot find symbol
                                packageLength = parcelPackage.getPackageLength();
                                                             ^
  symbol:   method getPackageLength()
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:352: error: cannot find symbol
                                packageWidth =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                    ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:353: error: cannot find symbol
                                parcelPackage.setPackageWidth(packageWidth);
                                              ^
  symbol:   method setPackageWidth(double)
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:355: error: cannot find symbol
                                packageWidth = parcelPackage.getPackageWidth(); //
packageWidth + packageHeight
                                                            ^
  symbol:   method getPackageWidth()
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:420: error: cannot find symbol
                                packageHeight =
Math.ceil(parcelPackage.keyboard.nextDouble());
                                                                     ^
  symbol:   variable keyboard
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:421: error: cannot find symbol
                                parcelPackage.setPackageHeight(packageHeight);
                                              ^
  symbol:   method setPackageHeight(double)
  location: variable parcelPackage of type Package
ParcelTerminalDemo.java:423: error: cannot find symbol
                                packageHeight = parcelPackage.getPackageHeight();
                                                             ^
  symbol:   method getPackageHeight()
  location: variable parcelPackage of type Package
15 errors
error: compilation failed

D:\GitHub\MIS76810032024Sprg\src\MIS768\edu\unlv\mis768\kly\individualassignment3\re
do>
 */

                // I no longer need this, it works, and I know that //
                // System.out.println(packageShippingChargeArray);
                // keyboard.nextLine(); // this is for testing .length //
```

```
packageHeight =
                // Math.ceil(parcelPackage.keyboard.nextDouble());
                // public int theFrequentShipperIdentificationNumber;
                // I might have to move this into the Shipment class
                // int theFrequentShipperIdentificationNumber;
                // System.out.print(reset+"Please enter your frequent shipper
identification
                // number: " + green);
                // theFrequentShipperIdentificationNumber = keyboard.nextInt();
                // // int // packageShippingChargeArrayLength =0;
                // int packageShippingChargeArrayLength =
packageShippingChargeArray.length;
                // System.out.println("You are shipping a total of "+ +); //
                // packageShippingChargeArray.length;
packageShippingChargeArray.length
                // This is finally done. I'm not even really ready to read about
whatever
                // shortcomings it has.
                // i changed this to string to make it easier to process, there
                // kept being an integer error, so i figured, a shipper number
                // is really more like a numberName rather than // it's
                // basically a numerical name, not a real number.
                // Integer.parseInt(keyboard.nextLine());// keyboard.nextInt(); //
                // Integer.parseInt(keyboard.nextInt())
                // int // packageShippingChargeArrayLength =0;
                // int packageShippingChargeArrayLength =
packageShippingChargeArray.size(); //
                // what a nightmare, .length is for an array, for an array list, you
use .size()
                // I don't know why I have to do this, but I have -- and i mean,
it's required
                // by the assignment that I do this.
                // when i say: i have to do this, I have to make a distinction
between my own
                // issues, and the assignment requirements,
                // but i basically have to push the customer ID into the shipment
class.
                // and pull it right back out. hahahaha - nightmare.

                // actually I don't think I have to pull it back out, i just have to
push it in.
                // i'll pull it out, in the sense that it factors into the
discounts, but it's
                // not otherwise being pulled back out in it's original form.

                // packageShippingChargeArray.length;
packageShippingChargeArray.length
                // this pushes the number of packages into the Shipment.java class
//
                // shipment.// setTheTotalNumberOfPackages(int theTotalNumberOfPkgs)
```

```
...

                        // System.out.print(reset+"Will you be shipping any
additional parcels? ("+
                        // green +"Y"+reset+"/"+reset+red+"N"+reset+"): "+green); //
this was a headache
                        // just to make the Y and N green and red
                        // I really want to remove these parentheses // let's see if
it works.
                        // char yesOrNoEntry = keyboard.next().charAt(0); // allows
a Y/N
                        // or Yes/No response
                        // keyboard.next
                        // keyboard.nextLine(); // what a nightmare.


...

                        // Shipment shipment = new Shipment();

                        // Shipment shipment = new Shipment(billableWeight);

                        // i really don't know how to resolve this issue.
                        // (formatDoubleDollars.format)

                        // DecimalFormat formatDoubleDollars = new
DecimalFormat("0.00");
                        // i don't know what to do here
                        // I think that I got this thing to work. let's see if it
actually does work or
                        // not.

                        // System.out.println(packageShippingChargeArray);
                        // packageShippingChargeArray
                        // I know what the issue is: I changed the name of the array
earlier //
                        // shipment.packageShippingCostsArray.add(billableWeight);

                        // CreateTranscript transcript = new
CreateTranscript(courseNumber, courseHours,
                        // letterGrade);
                        // transcript.setLetterGrade(letterGrade);
                        // numberGradeArray.add(transcript.getNumberGrade());

                        // shipment.packageShippingCostsArray.add(billableWeight)
                        // numberGradeArray.add(transcript.getNumberGrade()); //
letter grade converted
                        // to numerical value and added to array
```

```
                        // shipment.addShippingCost(billableWeight); //
                        // packageShippingCostsArray.add(shippingCost);

                        // System.out.println(reset+"The parcel has a dimensional
weight of: " +
                        // formatDouble.format(dimensionalWeight));
                        // entryNumber++;

...
```

What a nightmare. I'm going to have to audit MIS 768

...

do stock trade settlements occur at the end or beginning of the trading day

Currently, settlement date occurs two business days after trade date, but recent rule amendments from the Securities and Exchange Commission (SEC) and conforming FINRA rule changes will soon make that cycle one day shorter.Jan 30, 2024

The U.S. Securities and Exchange Commission (SEC) announced that it would shorten the standard settlement period from T+2 to T+1, which is expected to take effect in May 2024.

https://www.finra.org/investors/insights/understanding-settlement-cycles#:~:text=Currently%2C%20settlement%20date%20occurs%20two,that%20cycle%20one%20day%20shorter.

...