

Evolution of Synthetic Intelligence Against Artificial Intelligence: What Librarians Should Know

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Abstract: *In recent time, there is this scientific thought that the intelligence of machine needs not to be artificial rather superficial and genuine form of intelligence. In this regard, the need to come with a machine that operates under the claim of “genuine intelligence” arose, given rise to the evolution of what is in recent time traded as ‘Synthetic Intelligence (SI)’. This paper therefore takes a look at this term synthetic intelligence, conceptualizing the similarities and differences between it and AI as well as areas librarians can leverage on to enhance effective and efficient library services. The paper which was guided by three main objectives, adopted interpretive content and document analysis method aimed at conducting an all-embracing review and analysis of collated literature from different databases. Based on analyzed literature, the paper identified that there exist, some similarities and differences between SI and AI. In terms of similarities, it identified that both AI and synthetic intelligence involve the use of computers and algorithms to create intelligent systems among others whereas, their differences include that while AI is the development of computer systems that can perform tasks and make decisions that would typically require human intelligence, synthetic intelligence goes a step further by creating computer programs or systems that are not just imitating human intelligence, but are designed to possess an entirely synthetic or manufactured form of intelligence but in all, both are computer based intelligence. It was also realized that SI, inter-alia can assist librarians with back-office duties in that computers can now complete regular tasks, such as inventory and catalogue management, holds and reservation management, circulation and check-out and fine notifications and fee collection. Based on the analyzed literature, the suggestion is that librarians as digital literacy advocates and custodians of knowledge should tailor their minds towards understanding SI principles, applications, and ethical considerations, as it will help them better navigate the future landscape of intelligent systems and their integration into the global digital ecosystem as well as having it at the back of their minds, that SI and AI are one and same thing but the differences are their approaches and goals.*

Keywords: synthetic intelligence, artificial intelligence, librarians, technology

INTRODUCTION

The millennium we are in no doubt, has witnessed one man's most technology technology and saw man coming up with one of the greatest invention of all time; the emergence of Artificial intelligence (AI) and its associated offshoots such as machine learning (ML), Deep learning (DP), avatar, Generative-AI, Natural language processing (NLP), Chatbot among others. The whole idea was based on the simulation of the human intelligence and mimicking human by machines. All inventions so far is based on the mother of all inventions – the computer. Suffice to say, that AI is an inclusive brain in machine format that simulates human intelligence and programmed to think like humans and mimic their actions (Onwubiko, 2025a).

Despite its advancements, AI remains a probabilistic system that relies on complex algorithms, filters, and normalization frameworks to optimize its performance. Its validation process is based on polarized feedback, which includes user interactions, prompt engineering dynamics, and collected opinions on performance. Regardless of design nuances, such as latency, state space mechanisms, back-propagation modeling, or feedback augmentation, AI's fundamental nature remains unchanged. Even with red teaming training, AI systems are predisposed to operate within predetermined parameters, lacking the capacity for consciousness, sentient personal characterization, grounded knowledge beyond patching -rephrasing nor critical moral reflection. Against these backdrops, there came the need for an alternative or an opposite concept for AI that will work in the contrary since AI is built based on imitating the human intelligence and guided by set of algorithms. This is built on the assumption that the intelligence of machine needs not to be artificial rather superficial and genuine form of intelligence. In this regard, the need to come with a machine that operates under the claim of “genuine intelligence” arose, given rise to the evolution of what is in recent time traded as ‘Synthetic Intelligence (SI). It is referred to as a form of intelligence that is not merely a simulation of human thought as does AI, but represents a genuine, unique approach to intelligence creation (Wikipedia, 2025).

The assertion is that SI is overtaking AI by creating genuine human-equivalence or human-like intelligence, not just a simulation like AI and it does not only converses like a human but also understands concepts, forms intentions, adapts goals, and perhaps develops consciousness. Above all, SI goes beyond simulation to real cognition. Furthermore, unlike AI which often mimics human intelligence, SI is aimed at creating genuine cognitive abilities as in the areas of reasoning, understanding, and adaptive learning closer to how humans think. The underlying factor is that the strength of SI rest on its potential to move from mere machine acting smart to machines that is ‘human’ in thinking with cognition, adaptation as well as creativity that is a replica of human intelligence.

Considering the fact that librarians in the changing sojourn of human technological creativity, are playing pivotal role by being adaptable, visionary and dedicated to making knowledge accessible despite rapidly changing technological landscapes (Shahzad, and Khan, 2023). As a result,

librarians have traverse from conventional caretakers of physical collections to creative digital stewards highlighting their all important role in reshaping the information domain. They have evolved from custodians to facilitators of digital information products and services; harnessing digital resources; information literacy advocates; integration of emerging technologies; digital access and preservation; community engagement in the digital realm; advocacy for open access and digital inclusion; as well as integrators of technology and futurists (Onwubiko, 2025b)

This paper therefore, is aimed at creating the awareness among librarians as custodians and driving access to information and knowledge and in recent time digital literacy advocates the evolving of the new technology – synthetic intelligence. The topic will cover areas such as; comprehending SI, the difference between SI and AI, SI and the library among others.

Objectives

This paper is aimed at achieving three main objectives. These are, to:

- I. Explain what Synthetic intelligence is all about to the understanding of librarians;
- II. Identify the similarities and differences between SI and AI and,
- III. Highlight areas SI can be used in the library.

METHODOLOGY

To realize the purposes of this paper, it adopted interpretive content and document analysis method. This is aimed at conducting an all-embracing review and analysis of collated literature from different databases. This approach in literature gathering was adopted as to ensuring a holistic and well-grounded assessment of the topic being studied and to throw more light on it. The paper also carefully, perused and interpreted all materials in text under content and document analysis which gave room for clearer understanding of the topic treated. The reason for adding materials from different databases is to get a better picture of the technology and prove the good quality of the believability and trust of the outcome of this study. The implication is that the method gave room for a total search for all related materials on the subject.

Comprehending Synthetic Intelligence

Synthetic intelligence (SI) as a term, came into limelight in mid 1980s, when it was first used by Haugeland to describe artificial intelligence research to a level which he christened "good old fashioned artificial intelligence" or "GOFAI" for short. As first general artificial intelligence (AI) researchers, their belief was that their approaches or techniques will lead to the invention of machines that will have intelligence like that of the humans. It was when their efforts never shielded the expected fruit that they resort to focusing on artificial intelligence (Haugeland, 1985; Edsger, 1986). The main purpose to which they shifted their techniques towards the invention of AI was to find solution for specific individual problems in the likes of machine learning (ML) often referred by many AI experts as weak or applied AI (Drew,1997).

Over time, SI has evolved from simple rule to what is today shaping industries and the world at large not minding that it is most times, contrasted with traditional artificial intelligence (AI). While AI typically aims to replicate humanlike behavior and thought processes, synthetic intelligence seeks to create systems that function through unique methodologies and processes. This means that synthetic intelligence does not have to mimic human reasoning to be effective; instead, it can develop its own forms of problem-solving capabilities. It against this backdrop that synthetic intelligence (SI) is seen an alternative/opposite term for artificial intelligence emphasizing that the intelligence of machines need not be an imitation or in any way artificial; it can be a genuine form of intelligence (Wikipedia, 2025).

The underscore is that synthetic intelligence marks a significant leap in technological advancement, transcending traditional AI. With its unique approach to problem-solving and broad applications, SI is not just shaping the future of industries but also turning to be the technology that is about ruling the world. The implication is that synthetic intelligence aims to create machines that not only process information but also understand, reason, and learn in ways that closely mimic human cognitive processes. It is therefore, a transformative force that mimics and exceeds the capabilities of human intellect and reshapes industries. Using technologies such as machine learning, deep learning, and neural networks, SI is positioned to work unsupervised. In this area, libraries and librarians should leverage on (Capitol Technology University, 2018)

This implies that Synthetic intelligence is an intelligence created by humans but which does not necessarily mimic or imitate human intelligence rather functions as a genuine form of intelligence, which in most times contrasts with the more abstract, algorithmic nature of "artificial intelligence". It can encompass various approaches, including building physical, brain-like devices or using biological materials like neurons to create intelligence that interacts with its environment and learns independently. The emphasis being that the term "synthetic", does not stand for fake or imitation but rather the emphasizes is on a man-made creation that can be a genuine, potentially superior, form of intelligence (Pittman, 2018).

Be that as it may, synthetic intelligence also refer to tangible, physically-made systems, such as brain-like hardware, in contrast to the more abstract algorithms often associated with artificial intelligence. While research approach to synthetic intelligence focuses on building learning brains based on the biology of neuronal structures, aiming for systems that are more energy-efficient and adaptable than current silicon-based AI. It is also very imperative to state that some approaches to synthetic intelligence leverage biological materials, like in vitro neurons, to create computational systems that exhibit more natural forms of intelligence than traditional methods. In this regard, SI has been variously defined. As asserted by TechRound (2025), SI is all about the development of machine intelligence that operates autonomously and is capable of learning, adapting, and potentially able to solve problems. It is also seen as a term emphasizing that true intelligence expressed by computing machines is not an imitation or artificial. At its core, synthetic intelligence is about building systems that simulate and even reproduce aspects of human

intelligence, rather than simply programming machines to follow set rules. According to Softude (2023), synthetic intelligence, refers the capability of artificially created systems to exhibit intelligent behavior comparable to or even beyond human. While to AI Admin (2025), Synthetic intelligence means a machine that can behave and think like a human and can perceive or feel things. SI therefore, is a form of intelligence that is not merely simulation of human thought but represents a genuine, unique approach to intelligence creation. The crown glory is that while some synthetic intelligence aims to replicate human brain processes, the concept also allows for intelligence that operates autonomously and adapts without direct modeling of human cognition. In essence, synthetic intelligence proposes that intelligence is a physical phenomenon that can be built and engineered, potentially leading to forms of intelligence that are not just copies but new, organic, and powerful systems (Google Cloud, 2025).

In defense of SI, Pittman (2018) argued that while these advances of AI are momentous points in human development, the public has been told a lie as thinking machine cannot be artificial in that artificial intelligence is a simulated intelligence. He posits that, a genuine non-human intelligence may not be out of reach if one begins to seriously consider *synthetic intelligence* but also noted that the race to create human-like intelligence is folly. He added that the use of *synthetic* in the phrase synthetic intelligence does not, as some take it, mean *fake*. Rather, the use of synthetic implies a synthesis of foundational elements into something that is very much like something else. He buttressed his claim with an analogy that a synthesized diamonds which is compressed carbon albeit in a laboratory setting are no less than real than natural diamonds pulled from the ground. In all, what he failed to reveal to digital world is that once a product is not natural or God made whether it is simulated or synthesized, it is 'artificial'.

Similarities and Differences between SI and AI

In the present global digital ecosystem propelled by technology and innovation, the terms artificial intelligence (AI) and synthetic intelligence (SI) are often used interchangeably. However, there exist some similarities. In the first instance, both AI and synthetic intelligence involve the use of computers and algorithms to create intelligent systems. Secondly, AI and synthetic intelligence are both computer-based systems that aim to mimic human intelligence, and both AI and SI involve the creation of virtual intelligence. This means that both are computer based intelligence. Be that as it may, there is a subtle distinction between these two concepts that is worth exploring. Inasmuch as some sources disagree about exactly what constitutes "real" intelligence as opposed to "simulated" intelligence and therefore whether there is a meaningful distinction between artificial intelligence and synthetic intelligence. Eventually, Pittman (2018) posits that artificial intelligence is a simulated intelligence and a dead end, while synthetic intelligence is a synthesis of foundational elements into something superior. He challenges one to explore the means to synthesize. Regardless of the positions of different authors, Artificial intelligence (AI) and synthetic intelligence may be two terms that are often used interchangeably, but they actually refer to different concepts in the field of computer science.

Artificial intelligence refers to the development of computer systems that can perform tasks and make decisions that would typically require human intelligence. These machines are designed to simulate human cognitive processes, such as learning, problem-solving, and perception. The systems utilize algorithms and data to analyze, interpret, and respond to information in a way that resembles human thought. This implies that AI is the simulation of human intelligence in machines that are programmed to think, reason, and make decisions like humans, and uses algorithms and data to enable machines to mimic human cognitive functions. It therefore, relies on the idea that intelligent behavior can be replicated in a computer system by programming it to follow certain rules and patterns, and they are designed in such a way that they learn from their experiences and improve their performance over time. AI systems can process large amounts of data, recognize patterns, and make predictions. The implication is that AI focuses on developing systems that can think and learn like humans and it is used in wide range of applications such as healthcare, information management, finance and transportation among others as well as used in solving problems and making decisions in real-world scenarios.

On the other hand, synthetic intelligence goes a step further by creating computer programs or systems that are not just imitating human intelligence, but are designed to possess an entirely synthetic or manufactured form of intelligence. Synthetic intelligence aims to create machines that have cognitive abilities beyond what humans are capable of. This type of intelligence focuses on virtual or simulated environments where machines interact with each other and their surroundings. In other words, SI is the creation of completely new and artificial cognitive systems that do not rely on imitating human intelligence. Instead of imitating human thought processes and behaviors, synthetic intelligence aims to create machines that have their own unique forms of intelligence. These machines are not limited by the constraints of human cognition and can think and learn in ways that are completely different from how humans do (Neurolaunch, 2024).

Specifically, Synthetic intelligence focuses on the creation of new intelligence systems that are not confined to human-like thinking; seeks to push the boundaries of what machines can do and explore new possibilities in intelligence, it research is concerned with developing novel algorithms and architectures to enable machines to think and learn in novel ways, and finally, it aims to create machines that can solve complex problems and make decisions beyond the capabilities of human intelligence. Synthetic intelligence is typically used in virtual environments or simulations to create intelligent agents that can interact with humans or perform specific tasks in a controlled setting as well as often used in applications where predictable and consistent behavior is desired, such as in gaming, virtual assistants, and robotics. (Industry Wired, 2024).

Furthermore, one of the outstanding characteristics of AI is its ability to adapt and respond to new information. In that, it can analyze data and draw conclusions, allowing it to solve complex problems, while SI is the creation of computer systems that are designed to mimic human intelligence but are not based on actual learning or adaptation and is programmed with pre-defined rules and algorithms that determine its behavior. Unlike AI, synthetic intelligence does not have the ability to learn from new experiences or improve its performance. It operates within the boundaries set by its programming and cannot adapt to new situations.

Synthetic intelligence can be implemented through a variety of means, including virtual intelligence, artificial life, and simulated intelligence. These methods involve creating synthetic systems or organisms that exhibit complex behaviors and possess intelligence in their own right. Synthetic intelligence has the potential to surpass human intelligence in certain areas and explore new possibilities that may not be achievable by traditional AI methods (Softude, 2025). One other key differences between AI and SI is the level of complexity and sophistication in their respective algorithms. While AI focuses on solving specific tasks and problems, SI aims to create a more holistic and human-like intelligence. Additionally, AI systems often rely solely on computational power and data analysis, while SI systems incorporate elements such as emotional intelligence and social interaction to create a more immersive and interactive experience (AI Admin, 2025).

The summation is that both AI and SI are involved in the creation of virtual intelligence, but tend to differ in their level of complexity, focus, and purpose. In that AI is more task-oriented and aims to solve specific problems, while SI aims to create a more human-like and interactive intelligence. Invariably, the distinction between artificial intelligence and synthetic intelligence lies in their approach to simulating and replicating human intelligence, and the specific goals they aim to achieve.

So, in essence, AI is focused on replicating human intelligence in a computerized form, while SI delves into the creation of entirely new and synthetic forms of intelligence that are not limited by human cognition. While both AI and SI are groundbreaking fields of research, it is their different approaches and goals that set them apart. One thing is sure and that is as both fields have their own goals and approaches to achieving intelligent machines their development will continue to advance the capabilities of machines in different ways. The world is watching as it will be fascinating to see how these two areas of study evolve and what new possibilities they will unlock. While both artificial and synthetic intelligence share the common goal of creating intelligent systems, their approaches and methodologies differ significantly. Artificial intelligence aims to imitate human intelligence, while synthetic intelligence seeks to go beyond it and create new forms of intelligence. Understanding these differences is crucial in order to fully grasp the advancements and potential of both fields.

Synthetic Intelligence and Librarians

Synthetic Intelligence one can say, marks a significant leap in technological advancement, transcending traditional AI. It is recorded to have unique approach to problem-solving and broad applications. To this end, SI is not just shaping the future of industries but also becoming as assumed the machine with real intelligence. Librarians as information managers and advocates of digital literacy are known to be on the driving seat of embracing any new technology that can enhance accessing information and facilitating the provision and satisfaction of the information needs of their communities. Just as stated by Soliman et al. (2024) libraries have accepted digital technologies as ways of expand their reach and engage with patrons in new and innovative ways. In recent time, one technology that has taken the forefront in library services and which has been

holistically embraced by librarians, is the artificial intelligence with its associated offshoots. With the evolving of SI as an alternative or opposite of AI, its acceptability among librarians will not be in doubt. Since the SI and AI are almost the same kettle of fish, their applications in the library will be liken to that of the AI

Generally, synthetic intelligence has potential applications across various fields, including health care, education, and environmental science. For instance, in healthcare, synthetic intelligence can facilitate quicker diagnoses and personalized treatment plans. The focus is not just on smarter algorithms but on conceptualizing entirely different approaches to problem-solving which the libraries will also gain from. As asserted by IFLA (2018), librarians are still central to the library's workflow, and AI or SI with its associated tools is simply designed to complement the librarians' experience and knowledge as a search that is only as good as the search terms put in. In addition asserts Collection HQ (2024), AI viz-a-viz SI, can also assist librarians with back-office duties in that computers can now complete regular tasks, such as inventory and catalogue management, holds and reservation management, circulation and check-out and fine notifications and fee collection.

Come to think of it, synthetic intelligence is not just an intelligent system or software program, it focuses on building learning brains based on the biology of neuronal structures, aiming for systems that are more energy-efficient and adaptable than current silicon-based AI.. Intelligent library systems can rely on synthetic intelligence technologies to provide knowledge-based services to library clientele and staff.

Furtherance, when SI comes in full stream and alive, librarians will work with it as partners in progress as published materials will become living system that adapt through user feedback, data and according to the librarians' direction. Working together will iterate futures, refine performance and seize new opportunities for librarians.

Above all, considering its genuine form of intelligence, working with SI, librarians will not be working with static buildings rather, they will become symbiotic loop with SI and this will help them to continuously shape and upgrade their reality. In nutshell, the assertion is that SI will not only perform all the functions carried out by AI, it will also do more while thinking for itself unlike AI; that has to be programmed in line with the human intelligence. In all therefore, librarians should see SI as a continuum of a better AI and build from there. On the other hand, since every technology comes with its own associated ethical conundrums, the adoption and utilization of SI call for caution. The emphasis is that as with any advanced technology, synthetic intelligence raises ethical questions regarding its development and use. Issues such as privacy, the balance between technological advancement and societal impact, and the implications of creating systems that may operate independently of human oversight are critical areas of discussion. The last calls for concern as nothing made of man can be absolutely perfect as to operate without human touch or control.

CONCLUSION

The paper delved into the intricacies and dynamics of SI, the difference between it and AI as well as how it can be useful to librarians and ethical conundrums with a view to creating the awareness among librarians. The summary of it all, is that there is an evolving technology that is known as synthetic intelligence which as presented by the inventors and progenitors represents a frontier in technology that aims to create unique forms of intelligence distinct from traditional AI. As librarians who are digital literacy advocates and custodians of knowledge understanding its principles, applications, and ethical considerations, will help one better navigate the future landscape of intelligent systems and their integration into the global digital ecosystem. On the other hand, librarians should have it at the back of their mind, that SI and AI are one and same thing but different in approaches.

Basically SI and everything therein is synonymous with AI, particularly in the context of synthetic data sets except one wishes to refer to robotic self-awareness system (partially off human reasoning but human design learning and unsupervised labeling and learning in a mirrored or synthesis environment of its own sensing or adaptation of real environment). The totality of it all, is that whether called AI or SI it all about computer intelligence (CI). As asserted by AI for Social Good (2025), Computer-generated intelligence refers to any intelligence that is created or generated by a computer. This could include both artificial and synthetic intelligences. On the other hand, simulated intelligence refers specifically to intelligence that is simulated or replicated from existing data or models. Computer intelligence can also be referred to as the level of smartness or cognitive abilities possessed by a machine that involves the use of algorithms, data, and computational power to perform tasks that would typically require human intelligence. Computer intelligence is often associated with artificial intelligence (AI) and is used in various applications such as speech recognition, image processing, and decision-making systems.

This paper is of the view that AI and SI are issues of semantics as both are computer based intelligence that can only operate by mimicking the human intelligence. Which implies, that they are all artificial intelligence as long as they are not God made. Suffice to say, that SI is an enhanced AI therefore, the emergence of SI cannot be assumed to be the death of AI as both can exist in their various levels and purposes. The emphasis is that artificial intelligence and synthetic intelligence are distinct concepts with their own unique features and applications. AI is focused on harnessing real-world data and experiences to imitate human intelligence, while SI is a simulated form of intelligence that is created artificially. Basically, both technologies, have their advantages and limitations, and their significance will continue to evolve as technology advances.

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