

Unlocking Societal Recognition and Acceptance: A Case Study of Python

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Abstract: This study employs Python, a high-level programming language, as a case study. By analyzing the inherent characteristics of Python within its social context, this study explores its advantages in meeting social needs, influencing social psychology, and garnering external support. The primary objective of this analysis is to disrupt the established monopoly held by older programming languages such as Java, Rust, and C++. As a result, Python has emerged as the most widely utilized and popular programming language globally. Using Python as a representative example, this study extends its focus to examine the conditions under which products across various societal domains not only gain recognition but also find widespread acceptance and application in the world. Through thorough scrutiny within the demanding landscape of society, the study contends that products meeting such conditions are well-positioned to contribute significantly to societal progress.

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1. Why Python is so popular

Python, a prevalent high-level programming language in the contemporary era, was conceived in the early 1990s by Guido van Rossum at the National Research Center for Mathematics and Computer Science in the Netherlands, emerging as a successor to the ABC language. Over approximately three decades, Python has evolved into the versatile and widely used language we encounter today, undeniably impacting various facets of our lives.

This study seeks to elucidate the factors contributing to Python's widespread popularity within the societal framework. Python serves as a representative case to clarify the conditions under which other scientific products gain societal acceptance. The primary significance of this exploration manifests in two key aspects: firstly, aiding relevant organizations, enterprises, or individuals in crafting products that genuinely resonate with society; and secondly, facilitating the fine-tuning of exceptionally meritorious products, ensuring their alignment with societal needs, widespread adoption, and resilience against being overshadowed by the currents of societal change.

1.1. Development needs

In today's society, the shift from informatization to digitalization and intelligence is evident. The straightforward dissemination of simple information no longer suffices to meet the basic needs of society. The pivotal factor influencing and driving this transformation is the development of artificial intelligence, and the emergence of Python is a response to these evolving development needs.

Firstly, let's address the issue of development efficiency. It is crucial to understand that digitalization and intelligence are concentrated in a technological product, that is, artificial intelligence. Python, in many ways, stands out as the optimal programming language for the development of artificial intelligence. While some programmers or computer-related practitioners argue that Python's running and computing speed is slower compared to languages such as Java and C++ ^[1], they often overlook a significant aspect, that is, development efficiency.

Java and C++ exhibited complex syntax and high development difficulty, challenges that Python adeptly circumvents. Python's syntax is simple, its structure is clear, and what might take a hundred lines of code in a Java algorithm can be accomplished in approximately thirty lines in Python. For the sake of clarity, complex code is not presented here. As an illustration, consider a simple example of web page title crawling. The author conducted relevant experiments, and the code volume can be compressed up to five times, especially when dealing with anti-crawling mechanisms, as exemplified in the attached code page.

Python code sample:

```
import requests
from bs4 import BeautifulSoup
url = 'http://example.com/'
response = requests.get(url)
soup = BeautifulSoup(response.text, 'html.parser')
title = soup.title.string
print(title)
```

C++ code sample:

```
#include <iostream>
#include <fstream>
#include <string>
#include <cstdlib>
#include <cstdio>
#include <cstring>
#include <sys/socket.h>
#include <netinet/in.h>
#include <arpa/inet.h>
#include <netdb.h>
using namespace std;
int main() {
```

```

const char* url = "http://example.com/";
const char* filename = "output.txt";
ofstream outfile;
outfile.open(filename);
if (!outfile) {
    cerr << "unable to open document" << filename << endl;
    return 1;
}
string request = "GET" + string(url) + "HTTP/1.1\r\nHost:" + string(url) + "\r\n\r\n";
const char* request_cstr = request.c_str();
int sockfd = socket(AF_INET, SOCK_STREAM, 0);
struct sockaddr_in serv_addr;
bzero((char*)&serv_addr, sizeof(serv_addr));
serv_addr.sin_family = AF_INET;
serv_addr.sin_addr.s_addr = inet_addr("8.8.8.8")

```

Considering the contemporary landscape's increasing demand for algorithms characterized by robust scalability, particularly within the realm of artificial intelligence, a compelling need arises for the seamless integration of multiple algorithms to ensure optimal functionality. The intricate nature of these functions establishes an inherent interconnection. Consequently, the paramount focus shifts to the development efficiency of each individual function.

Chatgpt4, a forefront language model robot of recent years, features an operational structure encompassing approximately nine core functions. These include "natural language processing," "call knowledge base and background knowledge," "natural language generation," and "language translation." The successful execution of each function relies intricately on the functionality of the preceding ones. Within the development process, a meticulous approach to testing and debugging becomes imperative, occurring sequentially to guarantee the timely release of the language model robot for effective service to humanity and the community. In the context of this era's technological landscape, a pivotal question emerges: Which holds greater significance, the speed of execution or the efficiency of development? Undoubtedly, the latter takes precedence.

1.2. Alignment with the social psychology of young people

This aspect resonates well with the social psychology of young individuals, primarily fueled by two key factors. Firstly, there is a profound curiosity regarding the underlying principles of the Internet. Delving into the period spanning the early 21st century to around 2012, a pivotal historical stage for the Internet unfolds, from its introduction to widespread integration into households. During this epoch, societal expectations and enthusiasm for the transformative potential of the Internet were palpable, particularly among children. Exposed to various small and large online games since childhood, these experiences sowed the seeds of a desire to explore the intricacies of the Internet. Programming emerged as the optimal avenue for comprehending and navigating the underlying principles of Internet computers. While several programming languages were available, the high entry threshold of Java and C++ posed a barrier for many young computer enthusiasts. Python, with its concise syntax and clear structure, became the first programming language for numerous young individuals. Fond memories often include the initial execution of "print ('hello world')" or successfully copying a browser's

request header for a crawler, which is an enchanting initiation into the world of programming.

Another noteworthy aspect is Python's resonance with the psychology of young people who aspire to showcase their skills. In the realm of psychology, money and knowledge stand out as sources of superiority. Given the challenges in accumulating significant wealth for young individuals due to diminishing academic qualifications and limited social inclusion, there arises a pursuit of advanced and practical knowledge to establish a sense of superiority. Fields such as economics prove less effective, while philosophy has a limited audience. In contrast, computer programming technology, with its strong operability and broad audience, becomes the preferred choice. Python, with its user-friendly attributes – simple syntax, clear structure, and ease of initiation – once again emerges as the favored language for young individuals seeking logical clarity.

It is essential to clarify the emphasis on young people in this section. This choice stems from the understanding that the generation and evolution of most innovations and ideas in society are predominantly driven by the youth. Children and the elderly typically have limited influence on these developments, while many middle-aged individuals, having settled into stable lives, often adhere to concepts of the old era and display limited interest or resistance to emerging societal trends. Consequently, this section excludes them as research subjects.

1.3. Assistance from external forces

The emergence and subsequent surge of the short video industry have had a profound impact on the dissemination and consumption of information, including programming knowledge such as Python. In this context, “short” denotes brevity, catering to individuals with limited time spans and a preference for content that is both concise and engaging. The minimal time investment required for these videos, coupled with their high completion rates, has contributed significantly to their widespread popularity. People are drawn to these short videos due to their low cost of acquiring knowledge. However, this accessibility comes with its drawbacks. Some knowledge-focused bloggers use this platform primarily to generate traffic, resulting in content that may lack depth or expertise.

Within this landscape, Python has emerged as a pivotal programming language prominently featured across various short video platforms. The simplicity and ease of understanding Python make it a perfect fit for the short video format. It aligns well with the audience's fragmented time and relatively low demand for technical depth, fostering a consensus between content creators and viewers. A quick search for keywords such as “computer programming” on major short video platforms worldwide yields a plethora of Python-related content, solidifying its dominant presence. The fusion of Python with the short video industry underscores its adaptability and suitability for a format where brevity and simplicity prevail. This convergence effectively bridges the gap between bloggers seeking traffic and viewers seeking easily digestible programming knowledge. Consequently, Python has become a prominent fixture in the realm of short-form educational content. In fragmented time, short video users occasionally receive information about Python. Even if some users are not initially interested, repeated exposure strengthens their memory of Python. Some short video platform users may be influenced and even change the direction of their lives. At this juncture, the significance of the short video platform in disseminating Python-related content is most apparent.

Another contributing factor is the global initiative by governments to incorporate computer programming skills into compulsory courses in secondary schools and universities. In China, for instance, most provinces and cities have integrated Python programming into compulsory high school courses. Requirements from the “Information Technology Curriculum Standards for General High School (2017 Edition)” include units such as “Initial Understanding of Data and Calculation,” “Programming Calculation,” “Understanding Data,” and

“Calculation and Problem Solving.” In Russia, computer programming became compulsory in 2009, with Python widely introduced into the education system. European and American countries, including Finland, Britain, and Canada, have similarly embraced computer programming as part of the education system, with Python as the preferred language for its ease of comprehension. This global educational shift has played a crucial role in Python’s international popularity.

In the preceding discussion, the multifaceted reasons behind Python’s popularity were explored, shedding light on why this seemingly ordinary programming language has been embraced by society. Through the analysis of Python, the essential conditions for scientific and technological products can be distilled to gain acceptance within society.

2. Essential conditions

2.1. Aligned with the development trend of society

To understand the development trend of society, it must be recognized as a guiding direction that propels progress, exemplified by contemporary themes such as energy conservation, environmental protection, and sustainable development.

Society operates as an intricate ecosystem, requiring adaptation to myriad influences such as scientific and technological development, population dynamics, cultural shifts, and progress in various domains. Failure to align with the developmental trajectory of these factors can lead to elimination. A compelling example is Kodak, once the largest film production company of the last century. Established in 1880, Kodak thrived during the era of film cameras, leveraging excellent film production technology and widespread sales channels. However, as the late 20th century ushered in the digital camera era, Kodak faltered in adapting to the changing landscape. Lagging behind competitors such as SONY, Canon, and Nikon, Kodak missed the critical moment for digital business development, resulting in a drastic decline. Sales plummeted from \$14 billion to \$4.2 billion, prompting a desperate shift from film to digital. Even this move was not successful, with Kodak losing money on every digital camera sold. By 2012, facing bankruptcy, Kodak had to sell several assets, including its digital camera and medical imaging businesses, with only \$5.1 billion in assets and \$6.8 billion in liabilities ^[2].

Kodak’s downfall underscores the importance of adaptability, strategic vision, and market insight. Companies must maintain a keen understanding of market dynamics and exhibit an innovative spirit to navigate the evolving market environment. The lesson from Kodak’s story is clear: to be chosen by society, organizations must align with the development trend of society and synchronize with the various directional factors shaping its course.

2.2. In accordance with the will of humanity

Society, fundamentally composed of individuals, interprets social choices as a narrower form of human choice. All humans share a common trait, that is, the pursuit of convenience. Hence, aligning with the general inclinations of humanity, rooted in one or more aspects of human affection, becomes a pivotal condition for societal acceptance.

An observable phenomenon in daily life involves enterprises and organizations frequently prompting users to complete various questionnaires using diverse methods and for different reasons. Despite many individuals developing a numbed response to these requests, few pause to consider the underlying motive, often driven by the profit and long-term development perspectives of enterprises and organizations. These questionnaires serve the purpose of gathering customer opinions to enhance products, foster customer retention, and attract new customers. A contemporary example of adapting to human preferences is evident in museums transforming

historical artifacts into digital images to captivate public interest^[3]. Museums, such as the National Museum of China, employ large screens allowing people to zoom in on cultural relics' details. Questionnaires represent only a fraction of the methods devised by enterprises to understand people's sentiments and grasp evolving trends.

Generally, when a product aligns with the societal development trend, it naturally resonates with people's preferences. The reciprocal relationship between people's preferences and societal trends is subtly interconnected, akin to a two-way arrow symbolizing mutual influence and interaction. In essence, the will of people often shapes societal trends, illustrating the intricate connection between the two forces.

2.3. Social opportunities

The concept of opportunity often appears intertwined with luck, prompting contemplation on instances of prosperity throughout history, both ancient and modern, that transcended reliance on luck alone. Even when inevitabilities are present, the role of luck can influence the duration or various aspects of these occurrences.

In the pivotal year of 1974, Bill Gates made a strategic decision to depart from college, foreseeing the widespread utilization of personal computers. Collaborating with Paul Allen, they embarked on crafting a software system for the Altair 8800 microcomputer, overcoming the hurdle of limited hardware access. After two months of programming, Allen conducted the inaugural test of the software on the Altair in New Mexico. The success of their innovative software venture laid the foundation for Microsoft, now recognized as the world's largest software company.

The question arises: Did Bill Gates leave Harvard with a calculated gamble or a meticulously planned roadmap to success? Even with a well-defined plan, the establishment and developmental phases of any enterprise introduce a myriad of challenges. Navigating these challenges necessitates more than strategic planning; it often requires a touch of luck to calmly navigate through crises.

This phenomenon is not unique to Bill Gates or his company; it is a universal truth applicable to businesses, individuals, and organizations alike. Drawing a parallel to the earlier discussion on Python, its global prominence owes much to the rise of the short video industry. Without this pivotal trend, Python's historical inevitability might not have garnered as much attention. In essence, the short video industry, or what may be termed as Python opportunities, foreshadowed this situation.

Crucially, this research carries profound significance in aiding emerging products within society to secure acceptance. The primary objective is to extend assistance to more individuals, enterprises, and organizations for their success. The targeted service focuses on products in the research and development stage or those with greater scalability potential. Instead of drawing comparisons with existing structures and entrenched industry products, the emphasis is on the malleable developmental stages.

The first two essential conditions presented in this research propose actionable measures for product developers. They can strategically align with current social development patterns and leverage insights into human nature. The third point, being inherently more challenging to predict, underscores the importance of diligently addressing the first two conditions.

3. Conclusion

In the unforgiving landscape of societal preferences, the market unfolds as a battleground where countless products vie for attention. Amidst this fierce competition, successful products invariably share certain traits: a keen alignment with social development trends, a profound understanding of human nature, and a touch of serendipity. Identifying and embracing these shared characteristics in advance significantly enhances the

likelihood of success in the competitive market environment. In conclusion, navigating the intricate dynamics of societal choices requires a strategic grasp of these fundamental elements, guiding product developers towards a path of increased market resilience and acceptance.

Disclosure statement

The author declares no conflict of interest.

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