

DATA LITERACY FOR STARTUPS: TREND OR NECESSITY?

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Abstract: In times of Knowledge Society, knowledge has become the decisive economic resource. This involves the transformation of information into resources that enable an organisation to take effective actions. This contribution will focus on the processing of quantitative information by startups, which are inherently innovative, and the discovery, retrieval, and integration of information are crucial for their success in developing and scaling their business models in the digital world. In response to the question "What are necessary competencies for startups?" in the AI tool "Consensus", the summary of the Top 10 Papers highlights the importance of a "digital start-up mindset". Due to the ubiquitous availability of data, startups have virtually endless opportunities for pattern recognition regarding customer behaviour – provided Data Literacy is ensured.

Keywords: Data Literacy, startup, business metrics

1 INTRODUCTION

High-developed countries of the world live in times of Knowledge Society, where knowledge has become the decisive economic resource (Stehr & Ruser, 2017). Information is transformed into resources that enable an organization to take effective measures (Miloradov et al., 2022). This information can be quantitative or qualitative in nature – this article will focus on the processing of quantitative information by startups. Entrepreneurship refers to the establishment of innovative companies and the creation of new economic structures (Fueglistaller et al., 2020), while startups are understood as the manifested project of the entrepreneur, which shows potential for high growth. Research in the field of entrepreneurship and startups primarily deals with recognizing, evaluating, and exploiting entrepreneurial opportunities as well as enabling factors of entrepreneurial action (Fueglistaller et al., 2020). Startups are inherently innovative (Albaugh et al., 2020), and the discovery, retrieval, and integration of information are crucial for their success in developing and scaling their business models in the digital world.

The response on the question "What are necessary competencies for startups?" in the AI tool "Consensus" highlights the importance of a "digital start-up mindset" in the summary of the top 10 papers. This refers to a set of attitudes and behaviours that enable individuals and organizations to recognize how data, algorithms, and AI open new opportunities and pave a path to success in an increasingly data-intensive and intelligent technology-dominated business landscape (Neeley & Leonardi, 2022). Obviously, a digital mindset significantly contributes to the success of startups (Zaheer et al., 2019), as evidenced by the following facts: individuals who consider themselves digitally competent are twice as likely to start a business as those who do not. Individuals with digital skills also rate their own entrepreneurial ability more positively: more than half of digitally savvy individuals reported having the skills, knowledge, and experience to start a business. In the comparison group, only 37% expressed such sentiments (Schauer & Gorynia-Pfeffer, 2021).

The ability to systematically handle data and consciously use and question it in its respective context is referred to as Data Literacy. This includes data ethics, motivation, and values (Schüller et al., 2019). The following figure shows the elements associated with Data Literacy. It illustrates that it is a complex competence with aspects from a variety of areas.

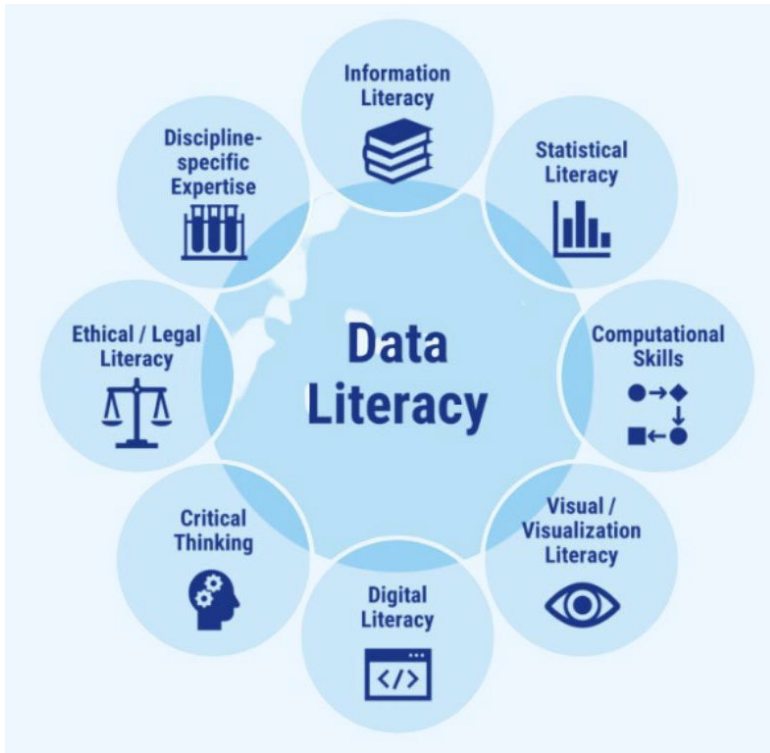


Figure 1: Elements of Data Literacy (Big Blue Data Academy, 2023)

Specifically, it seems relevant for entrepreneurs not only to be able to distinguish unstructured from structured data but also to be able to locate it initially. Due to the ubiquitous availability of data, startups have almost endless opportunities for pattern recognition regarding customer behaviour – provided they are “literate in data” (IHK, n.d.).

2 METHOD

For an initial overview of the topic, the method of choice is the narrative literature review. Relevant contributions were researched using the AI tools Elicit, Consensus, and Perplexity. Consensus was asked the question "What are necessary competencies for startups?", while in Elicit the formulated question was "Is Data Literacy important for startups?". Perplexity responded on the question "Why do startups need Digital Literacy?". The displayed results were each examined in more detail and used based on their relevance to the present contribution.¹

¹ It must be noted that the results generated by Elicit, Consensus, and Perplexity are not replicable regarding the search queries. This presents a weakness in that upon repeating the query later in Consensus, there was no longer any reference to the necessity of a digital start-up mindset. The literature sources found at an earlier time through this method do not lose their validity, of course. When using AI tools for literature search and analysis, it should be kept in mind that AI can strongly influence the direction of literature research.

In the further course of the research project, the conduct of qualitative expert interviews with entrepreneurs is planned to validate the hypotheses formulated.

3 METRICS FOR STARTUPS

3.1 BASICS ABOUT METRICS

For businesses, the question nowadays is less about what to measure, but rather what to evaluate and analyse. Google Analytics alone provides comprehensive tools for measuring and reporting various metrics. So, the challenge is not the lack of quantitative information, but rather the difficulty lies in selecting and correctly interpreting the right metrics. A good metric is characterized by being comparable and understandable. Firstly, it should be a measure that allows for comparability between different time periods, user groups, competitors, etc., to detect changes. Secondly, a good metric should be understandable: if recalling and understanding a metric is difficult, no matter how meaningful it may be, if it is "unwieldy", it is unlikely to be used (Croll & Yoskovitz, 2013). In "Lean Analytics", Croll and Yoskovitz (2013) make a vivid distinction between different metrics: they refer to "vanity metrics" as those metrics that give you a good feeling about conducting analyses but do not influence actual behaviour, or from which no concrete conclusions can be drawn, e.g., number of page views, number of followers, time spent on a website. For example, the more time spent on a website does not necessarily express great interest in the products offered. Possibly the reason for the long dwell time on the page may be that it is poorly structured or difficult to grasp quickly. Perhaps it was even that unappealing that the person looking at it left the computer for some time to get a coffee. Obviously, it is difficult to draw conclusions from some metrics since they may have arisen for various reasons.

In contrast, there are "real" or "actionable metrics": these influence the analyst's behaviour by providing guidance on the selection of approaches. Croll and Yoskovitz (2013) further divide these actionable metrics into leading, lagging, and causal vs. correlated metrics. While leading metrics attempt to forecast the future (e.g., number of potential customers in the sales funnel), lagging metrics provide clues to a problem (e.g., number of churned customers in a period). In distinguishing between causal and correlated metrics, Croll and Yoskovitz (2013) emphasize that correlating data does not necessarily imply causality. If one can identify a causal metric, it becomes possible to change the behaviour of the other variable by influencing one variable.

3.2 PREDICTIVE ANALYTICS FOR STARTUPS

In connection with models, including Predictive Analytics, the statistician George E.P. Box is often cited as having said, "All models are wrong, but some are useful." This encapsulates precisely what predictive models are suited for: providing guidance without possessing the qualities of a crystal ball. Predictive Analytics relies on the use of historical

data to predict future events. These predictions can relate to the near future (such as the likelihood of a machine malfunction) or the more distant future (such as predicting cash flow for the coming year). The methods used include statistical models (regression analysis, time series analysis) or machine learning, or a combination of a statistical model and machine learning. The use of historical data can be considered both a blessing and a curse: if the future behaves like the past, predictions about the future can be made based on past observations. However, if the future behaves differently in one or more parameters than the past upon which historical data is based, the models are not only useless but even incorrect. However, since Predictive Analytics is intended to support decision-making rather than be the sole parameter for making a decision, some examples will be given of how Predictive Analytics can be used for startups.

A challenging phase for startups is scaling, during which the company grows so rapidly and extensively that business processes need to be adjusted. This may include workforce planning. A multiple regression model can assist in determining future staffing needs to avoid costly underutilization, poor feedback, or overworked employees.

In the field of marketing, Predictive Analytics is extremely useful for behavioural targeting – predicting buyer behaviour, potential leads, and effectively planning campaigns (Cote, 2021). Predictive Analytics is also extremely useful in sales forecasting in retail. For example, it has been shown that using machine learning methods, the sales of pretzels in a medium-sized bakery can be predicted with high accuracy (Döring et al., 2021).

3.3 RELEVANCE FOR STARTUPS

Finally, the question of the extent to which data analysis is particularly relevant for startups arises. Studies have already shown that data analytics is a significant determinant in a company becoming an innovator and bringing innovative services and products to the market (Jahan & Sazu, 2022). Erevelles et al. (2016) are convinced that data analysis leads to hidden insights, which in turn can result in radical innovations. Especially in times of competitive markets, where great ideas are easily copied, a company must increase the speed of idea generation (Erevelles et al., 2007). The concept of data-driven entrepreneurship has already been established, whereby through data collection and analysis, market uncertainty in evaluating business opportunities is overcome (Çanakoğlu et al., 2018). Olszak et al. (2021) not only believe that the use of data promotes innovation within a company but also contributes to its sustainable development. Trabucchi and Buganza (2019) describe data as the trigger and enabler for an entire digital innovation process. Presumably, the "data hunger" is greater in the realm of data-driven business models or software startups than in other areas, yet metrics fundamentally serve in making the most objective decisions possible. Especially in areas of high uncertainty and limited resources, to name just two of many conditions that shape the conditions of startups, data analysis and associated fundamental knowledge are indispensable (Kemell et al., 2020).

4 FURTHER STEPS

In the further course, interviews with entrepreneurs are planned, who will be asked about their level of Data Literacy and to what extent they integrate it into their entrepreneurial processes. It will be interesting to find out whether there are differences in this regard between different industries in which startups operate. Perhaps the use of data analysis varies in terms of scope and methods depending on the phase a startup is in. For example, it is conceivable that different methods are used for market analysis compared to assessing necessary process adjustments during the scaling phase.

5 CONCLUSION

To the author's knowledge, there are currently no empirical studies regarding the Data Literacy of entrepreneurs. As this contribution has shown, the use of simple metrics to more complex methods like Predictive Analytics not only leads to more objective decision-making in uncertainty-driven business sectors but can actively promote innovation. These circumstances highlight the practical relevance of Data Literacy in the realm of startups, thus necessitating empirical investigation. Should the empirical study conclude that startups (in general or in specific industries) exhibit deficiencies in Data Literacy, subsequent consideration should be given to potential initiatives aimed at enhancing this skill.

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