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Таким чином, основними функціональними прогалинами наявних рішень є: відсутність комплексного поєднання голосового технічного інтерв'ю та практики розв'язання алгоритмічних задач, відсутність персоналізації сценарію співбесіди під вимоги конкретної вакансії, відсутність автоматизованого виявлення слабких тем та формування персоналізованих рекомендацій, відсутність механізмів довгострокового відстеження прогресу користувача.

Виявлені прогалини свідчать про актуальну потребу у створенні єдиного середовища, яке б інтегрувало голосову інтерв'ю-складову, AI-асистовану взаємодію та практику розв'язання алгоритмічних задач на основі технологій штучного інтелекту з урахуванням реальних вимог сучасного ринку праці.

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A MODEL FOR DETERMINING THE FUNCTIONALITY AND CONTENT OF A CORPORATE WEBSITE ACCORDING TO THE GOALS AND STRATEGIES OF INTERNET MARKETING

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1. Problem statement

A corporate website has long ceased to be an auxiliary information channel and has become the central node of the digital marketing system of an enterprise, integrating search optimisation, content marketing, social communications and paid promotion around a single fully controlled digital asset [2; 3; 6]. The practical question that arises at the very beginning of every web project, however, remains

methodologically unresolved: which set of functions and content elements does a particular organisation actually need, given the marketing goals it pursues.

In practice this question is answered intuitively or by imitation of competitors. The established methods of designing digital products do not close the gap either. Feature comparison matrices record the state of the market but give no normative answer; the Kano model [10] prioritises functions by perceived user satisfaction without connecting them to marketing outcomes; personas, user stories and user flows describe the user path rather than the marketing funnel. As a result, resources are distributed inefficiently: an organisation either pays for functionality its audience does not require, or leaves business-critical capabilities undeveloped.

The purpose of this paper is to propose a formalised model that maps the goals and strategies of internet marketing of an organisation onto a target configuration of functionality and content of its corporate website, and to state the procedure of applying that model both to the design of a new website and to the audit of an existing one.

2. The economic link between marketing goals and website functionality

To make the correspondence between marketing goals and website functionality formalisable rather than declarative, it is necessary to fix the mechanism through which the result of internet marketing reaches the result of the enterprise. This mechanism can be expressed through the decomposition of profit:

$$\text{Profit} = \text{MIN}(V; N \times F) \times (P - C) \quad (1)$$

where V is the volume of production, N is the number of customers, F is the frequency of purchases per customer, P is the price and C is the unit cost. The decomposition is deliberately simple, and its value is not in precision of measurement but in the fact that it enumerates exhaustively the levers through which any marketing activity can influence the financial result of an organisation: the volume of production, the number of customers, the frequency of purchases, the price premium and the level of costs.

Every task usually placed before internet marketing acts on exactly one of these levers, and this is what makes the correspondence between a goal and a website function non-arbitrary. Attracting new customers acts on N ; work with the existing customer base acts on F ; brand building acts on P through the perceived value of the product; recruitment of employees and attraction of partners act on V , which in the formula constrains the result together with demand; automation of service and self-service acts on C . The strategies of internet marketing systematised by Romanenko [1] — the strategy of information collection, the strategy of cost minimisation, the strategy of personal selling and the strategy of repeat sales — are distributed over the same levers, which allows the two classifications to be combined in one table.

The second dimension of the correspondence is the technological level at which a function is implemented. Following the evolution of internet technologies, three levels are distinguished: Web 1.0, in which the function is realised by static one-way means; Web 2.0, in which it is realised through interactivity, user-generated content and integration with external services; and the level of artificial intelligence, at which the function acquires personalisation, prediction and conversational interfaces. The same marketing task therefore corresponds not to one set of functionality but to three, differing in cost and in the depth of the effect achieved.

Table 1. Correspondence between the tasks of internet marketing, the levers of the economic result and the functionality of a corporate website

Task of internet marketing	Lever in (1)	Website function	Web 1.0	Web 2.0	Web + AI
Ensuring sales of products	$N \times F$	Transactional	Online ordering without online payment	Catalogue, cart, checkout, online payment	Conversational sales assistant; dynamic pricing
Attracting new customers	N	Promotional: product advertising	Product information, advantages, contacts, company history, SEO	Customer registration, reviews, expert product overviews	Personalised landing content; predictive lead scoring
Increasing the frequency of purchases	F	Promotional: work with the customer base	Loyalty programme information, on-site offers, remarketing	Recommendation blocks, integration of the website with CRM	AI recommender system; automated next-best-offer
Building the image of the brand	P	Promotional: brand promotion	Content marketing, news, company history	Blog, integration with social networks	AI content generation; real-time reputation tracking
Recruiting employees and partners	V	Informational	Vacancy list, advantages, contacts for proposals	Search of vacancies in a database, applicant account	AI matching of candidates and partner profiles
Reducing costs of service	C	Informational: self-service	FAQ, downloadable documents and forms	Personal account, online document workflow	AI assistant for the first line of customer support

Source: compiled by the author.

3. The formal model of the target configuration

Let the corporate website be described as a tuple $W = \langle F, S, C \rangle$, where F is the set of its functions, S is the set of its sections and subsections and C is the set of content elements. The union of these three sets forms a catalogue of n elementary functional and content components, so that any configuration of a website is representable as a binary vector.

Let the marketing intent of the organisation be described by a vector of goal priorities, obtained from the decision maker by pairwise comparison of the tasks of internet marketing on the fundamental scale of the analytic hierarchy process [9], the vector being the normalised principal eigenvector of the comparison matrix and accepted only if the consistency ratio does not exceed 0.1:

$$G = (g_1, g_2, \dots, g_m), \quad g_i \in [0, 1], \quad \sum g_i = 1 \quad (2)$$

For each task i and each technological level $\lambda \in \{1, 2, 3\}$ the reference configuration is fixed according to Table 1 as a binary vector, in which a unit denotes the presence of the corresponding element:

$$X(i, \lambda) = (x_1(i, \lambda), \dots, x_n(i, \lambda)), \quad x_j(i, \lambda) \in \{0, 1\} \quad (3)$$

The target configuration of the website is then formed as a weighted union of the reference configurations, in which an element is included when the total priority of the tasks that require it reaches a threshold θ set by the decision maker:

$$z_j = 1, \text{ if } \sum g_i \cdot x_j(i, \lambda) \geq \theta; z_j = 0 \text{ otherwise} \quad (4)$$

The threshold θ is the instrument by which the model is tuned to the resources of the project. A low threshold produces a broad configuration that serves secondary goals as well; a high threshold produces a minimum configuration concentrated on the dominant goal, which is in effect a marketing-driven definition of the minimum viable product.

For an existing website the same apparatus yields an audit. Let $Y = (y_1, \dots, y_n)$ be the binary vector of the elements actually present on the site, established by inspection. The discrepancy between the actual and the target configuration is measured by the weighted distance, and the degree of correspondence by the completeness index:

$$d(Y, Z) = \sqrt{(\sum w_j \cdot (y_j - z_j)^2)}; K = 1 - d / d_{\max} \quad (5)$$

where the weights w_j express the relative contribution of an element to the achievement of the goals and are obtained by the same hierarchy procedure. The elements for which $z_j = 1$ and $y_j = 0$ form the development backlog of the website, ranked by w_j , whereas the elements for which $z_j = 0$ and $y_j = 1$ indicate functionality that consumes resources without serving any declared marketing goal.

4. An illustrative example

The operation of the model is shown on the case of an online education provider whose marketing intent is dominated by the acquisition and retention of learners. Pairwise comparison of the tasks yields the priority vector $G = (0.34; 0.27; 0.21; 0.10; 0.05; 0.03)$ for, respectively, the attraction of new customers, the increase of the frequency of purchases, the building of the brand image, the direct sale of products through the website, the recruitment of employees and the reduction of service costs. The technological level is fixed at $\lambda = 2$ with selected elements of the third level, and the threshold is set at $\theta = 0.25$.

Table 2. Formation of the target configuration for the illustrative case at $\theta = 0.25$

Functional or content element	Tasks that require the element	Total priority	Decision
Product and course information, SEO landing pages	Attraction; frequency; direct sale	0.71	Include
Registration and personal account of the learner	Attraction; frequency	0.61	Include
Reviews and expert overviews of the courses	Attraction	0.34	Include
Recommendation blocks and integration with CRM	Frequency	0.27	Include
Blog and integration with social networks	Brand image	0.21	Exclude
Cart, checkout and online payment	Direct sale	0.10	Exclude
Search of vacancies in a database	Recruitment	0.05	Exclude
Online document workflow for learners	Cost reduction	0.03	Exclude

Source: calculated by the author according to expressions (2)-(4).

Two observations follow from the calculation. First, the configuration obtained is markedly narrower than the one that would result from an intuitive enumeration of desirable features: four elements out of eight are excluded because the goals they serve are secondary for this organisation. Second, the blog is the informative case, since its total priority of 0.21 lies just below the threshold. This is not a defect of the model but its intended behaviour: the element is not rejected outright, it is placed immediately behind the boundary of the first release, and lowering the threshold to 0.20 admits it. The model therefore makes explicit the decision that is normally taken implicitly, namely how much of the budget is spent on goals of the second order.

5. The procedure of application

The application of the model consists of five steps. First, the tasks of internet marketing of the organisation are identified and their priorities are established by pairwise comparison, which yields the vector G . Second, the technological level λ is fixed on the basis of the budget, the schedule and the competence of the team. Third, the target configuration Z is constructed by expression (4) for a chosen threshold θ . Fourth, in the case of an existing website its actual configuration Y is established by inspection and the completeness index is calculated by expression (5). Fifth, the difference between the configurations is transformed into a ranked backlog of development.

The practical effect of the procedure is that the composition of the website ceases to be a matter of taste. Each element in the specification is traceable to a marketing task, that task is traceable to a lever of the economic result in expression (1), and the priority of the task is fixed explicitly rather than implied. This traceability is equally valuable in the opposite direction: when a stakeholder proposes an element, the model shows which goal it serves and at what priority, and if the answer is none, the proposal is visible as such.

6. Limitations of the model

Three limitations should be stated explicitly, since they bound the interpretation of the results. First, the reference configurations of Table 1 are derived expertly from the analysis of the functions of corporate websites and have not yet been validated on an empirical sample; until such validation is carried out, the model reproduces the structure of expert judgement rather than an observed regularity, which is sufficient for making a design decision traceable but not for asserting its optimality.

Second, the binary encoding of the reference configurations assumes that an element either serves a task or does not, whereas in reality the same element serves different goals with different intensity: a product page contributes far more to acquisition than to retention. A natural extension of the model is therefore the replacement of the binary vector by a vector of degrees of membership in the interval from zero to unity, which converts expression (4) into a fuzzy aggregation and removes the discontinuity at the threshold.

Third, the result is sensitive to the value of the threshold, as the case of the blog in the illustrative example demonstrates directly. This sensitivity is not concealed by the model but is its instrument; nevertheless the substantiation of threshold values for different classes of projects and different budget constraints remains an open question and is one of the directions of further work.

7. Conclusions

The decomposition of the economic result of an enterprise into the volume of production, the number of customers, the frequency of purchases, the price premium and the level of costs provides a non-arbitrary basis for connecting the tasks of internet marketing with the functionality of a corporate website, since every marketing task acts on exactly one of these levers.

The correspondence constructed on this basis is two-dimensional: a marketing task determines which function is required, while the technological level of realisation, from Web 1.0 through Web 2.0 to the level of artificial intelligence, determines the depth at which that function is implemented and the resources it consumes.

The proposed model formalises the target configuration of functionality and content as a threshold-weighted union of reference configurations, with the priorities of the goals obtained by the analytic hierarchy process, and reduces the audit of an existing website to the calculation of a weighted distance and a completeness index, which yields a ranked development backlog as a by-product.

Further research is directed at the empirical verification of the reference configurations on a sample of corporate websites, at the substantiation of the threshold value for different classes of projects, and at the integration of the proposed model with the models of decision support for the selection of artificial intelligence instruments at the stages of designing and developing marketing web-based information and communication systems.

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ФОРМУВАННЯ ЦИФРОВОЇ КОМПЕТЕНТНОСТІ ЗДОБУВАЧІВ ВИЩОЇ ОСВІТИ ЗАСОБАМИ СУЧАСНИХ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ

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Сучасний розвиток цифрових технологій помітно впливає на всі сфери суспільного життя, зокрема й на систему вищої освіти. Цифровізація освітнього процесу змінює підходи до організації навчання, способи взаємодії між викладачами та здобувачами освіти, а також вимоги до професійної підготовки майбутніх фахівців. У таких умовах цифрова компетентність виступає не додатковою перевагою, а необхідною складовою професійної та загальної компетентності здобувача вищої освіти.

Цифрова компетентність передбачає не лише вміння користуватися комп'ютером, мобільними пристроями чи окремими онлайн-сервісами. Вона охоплює здатність ефективно, критично, безпечно та відповідально використовувати цифрові технології під час навчання, професійної діяльності, спілкування та розв'язання різноманітних завдань. Важливим є також розуміння можливостей і ризиків цифрового середовища, дотримання академічної доброчесності, захист персональних даних та відповідальне ставлення до поширення інформації.

Актуальність формування цифрової компетентності здобувачів освіти в Україні визначається, зокрема, Концепцією розвитку цифрових компетентностей. У цьому документі цифрову компетентність визначено як динамічне поєднання знань, умінь, навичок, способів мислення, поглядів та інших особистих якостей у сфері інформаційно-комунікаційних і цифрових технологій, що забезпечує здатність особи здійснювати професійну та подальшу навчальну діяльність із використанням таких технологій [1].

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